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THE WRITERS' PROJECT

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Letter from the Editor

In December of last year, my staff and I launched *The Labyrinth*, a newsletter written, edited, and designed by students in College of San Mateo's Honors Project to keep the campus up-to-date on the Honors community and its activities. This November, it was awarded "First Place" by the National Collegiate Honors Council for "best printed honors newsletter." It was a successful year for our little publication, but even so, we sought to redesign it, so that it could encompass talent from both inside and outside the Honors Project and feature a larger volume and different kind of work. Along with the changes to the publication, our club, which staffs the editorial team, was reborn as the Writers' Project and restructured to accommodate this new task.

What you're about to read is the sample issue of *Labyrinth*, an academic journal. This publication is a collection of peer-reviewed, scholarly, and artistic work from writers and artists at CSM, Cañada, and Skyline. My ambition for the spring 2015 full-sized journal is to bring forth some of the most interesting and complex pieces that are waiting to be discovered in the classrooms, notebooks, laptops, and minds of the diverse and enthusiastic scholars at all three colleges.

SMCCD students are making great contributions to the academic world and to each other, and we, the CSM Writers' Project and staff of *Labyrinth*, are proud to provide a platform where these contributions may be shared throughout our community. As you explore the sampler,



I hope you will recognize the excellence of our featured writers' and artists' efforts, encounter something inspirational, and learn something new.

Dee Dee Pickard Editor in Chief

LABYRINTH

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REFLECTION

TRANSCENDENCE: The Honors Experience

by ELENI JACOBSON

f course the Honors Project benefits its participants: our transcripts are inherently more competitive than they would be without the word "honors" typed next to one, two, or three of our foundation classes. But I want to share the more transcendent benefit that I've reaped since joining the Honors Project in Spring 2013. By transcendent, I mean that this benefit goes beyond your transcript or resume enhancement; it's woven into the fabric of your mentality.

I'm currently in my third seminar, and snapshots of scenarios I've found in the Honors Project classrooms could fill a photographic journal of experimental education. I want to share some of my favorite scenes that I've watched play out in Honors classrooms over the last two years:

- Pairs of students reviewing each others' 12-page-long rough drafts, methodically reading, re-reading, red-penning, and critiquing the typed pages before them.
- A classroom of students standing around the room on chairs as we scribble our topic outlines onto poster paper taped to the classroom whiteboards, then taking turns standing at our posters to present our ideas to the rest of the class.
- Peals of laughter rocking the roundtable as a wisecrack shatters our somber discussion of Sontag's *Regarding the Pain of Others*.
- A row of wrinkled foreheads and narrowed eyes slowly appearing as our conversation turns from lighthearted discussion of research methods to debates about morality in economics.

One student speaks up needing advice: her family life, workload, job, and research project are too much for her to maintain; she doesn't want to drop anything but knows her load is unsustainable. Whether she stays in the seminar or not, we all feel responsible for helping her come to the best decision; we sit there with her to discuss her options.

To join the program is to do much more than enroll in a series of seminars in which you discuss a research project you're creating from scratch. To enroll in the Honors Project is not only to get your foot in the door of intellectual rigor, but to fling that door open and jump in the deep-end of academic inquiry. This is not a logic class or a program designed to open your mind. It's a program that takes those with open minds and turns them into writers who can convey what they know, what they wonder, and what they've learned within a structured framework. Because here's the thing about research that the Honors Project has underscored time and again for all of its participants: Just like jumping hurdles or playing tennis, there is no finish line to proficiency.

In fact, enrolling in your first Honors Project at CSM has a lot in common with signing up for your first sports team. There are a surprising number of correlations between the two activities - let's say, for example, playing baseball and determining whether a landmark feminist publication from 1990 is still relevant.

Your classmates are your teammates - they cheer you on even when you fall down in the middle of the base-paths. They give you tips that they've learned about research or writing during their own career.

Your seminar instructor is the team manager - he or she has responsibility for oversight and planning of the entire seminar for the entire semester. A fantastic resource and source of perspective.

Your foundation instructor is the personal trainer who doles out the tough love and pushes you forward with high expectations and a demand for results.

Your friends who aren't in the program are like your friends who have never played the sport - you can go to them for support, but at the end of the day, you still need your team."

"To enroll in the Honors Project is not only to get your foot in the door of intellectual rigor, but to fling that door open and jump in the deepend of academic inquiry."



Untitled SPENSER GRIMM

You are you. You can have the greatest teammates, manager, PT, and support system in the world, but the practice comes down to you. Your dedication and determination to put forth your best work comes from you. I can't remember having done more than one group project in Honors, and that speaks volumes about the class - it isn't really a class about cooperation or learning to work with others. Those skills are incredibly important. But the stamp that the Honors Project gives your personality is ultimately one of personal responsibility. No one is going to do this complex project for you. You will have backup, and you will have expert support whenever you need it. But what the Honors Project teaches you – drills into your head – is that you are driving this tank, creating your own assignments, commanding your own deadlines, and controlling every aspect of the essay.

And that sense of responsibility is invaluable once you internalize it and begin to treat other aspects of your life the exact same way.

Fifteen Minutes of Peace

by MARY GRANADOS

Today, we walked around campus in silence for fifteen minutes. Usually, most of us are in a rush to get to class on time. We struggle with traffic and finding a parking space that isn't in South America.

We rush around missing life.

The path is direct. We never steer off the path; it's just too much work. My path is directly to the Hillsdale Parking Lot #3. I'm assured a space in this big world. I walk the same path every MWF, up the steep hill, right to the stairs, holding the handrail to the top, getting to building 16. I carry the weight of my heavy school bag, and the weight of my daily stress on the same path. Getting to school early, [I] go through my homework assignment. I sit in the same spot at the same time with the same faces, and in the same room. Too much of the same stifles me.

The exercise is a walk around campus, different from my usual route.

The silence was strong in this group.

During our walk, we were asked to notice "the little things" which we neglect. Even if life feels detached from humans, life would like some attention from humans from time to time. Right away, I felt less stressed.

Wow...Peace...at last!

I hear the sound of the gardener perfecting the grass.

The smell of the fresh cut grass was like a lavender bath.

The warm sun on my skin felt like my morning shower. There was a perfect stream of breeze that cooled my skin when the sun was too much.

Almost burning.

Did they just add these flowers to the campus?

No. I just didn't take the time to notice them before today.

The class followed the teacher to another part of campus: an image of a mother duck leading her ducklings to the safe area of the water. I hear a plane fly by, a crow cawing, and all of a sudden...a bug flies into the inside of my sunglasses. I made a choice...the bug or my view?

Forgive me for taking a life.

SWEET TWEETS FOR SWEET TREATS

Can you tell a story in 150 - 250 characters?

WINNER

The heavy hearted soldier knelt next to his brother. Their blood and sweat intermingled with the accomplishment of victory. Their victory was short-lived, their brotherhood endless.

MELISSA SEQUEIRA

RUNNER UP

I found myself looking at passing trains again. I always wondered what one looked like coming at you like a stampede of wild stallions. "Well, there is no time like the present" is what my wife used to say before the cancer won.

JAMES HALL



REFLECTION



Chocolate Museum in Brussels, Belgium DEE DEE PICKARD



by DEE DEE PICKARD

My daughter went to Europe this summer. It was the first time she'd travelled outside the United States. She spent a month on trains and busses; in hostels, hotels, and stranger's flats; lugging a pack we were sure fit her before she left the country; cycling through cobbled streets; hiking up and down stone stairways; and marveling at art, nature and culture so unlike her own.

Strange foods, foreign languages, jet-lag, bed bugs ("Chinches!" she managed, in her first-year Spanish to the hostal clerk) - this fearless thirteen-year-old of mine took it all in, and took even the most challenging of her travel experiences enduring her mother as a constant and sole companion – in stride.

I was a witness to the impressive and unexpected on this trip, though I didn't know it at the time. Those four weeks went

by lightning-fast, and thinking back, I almost can't remember being there unless I'm looking at the photographic proof. My daughter and I have stashed thousands of the most beautiful, majestic landscapes and structures – all in perfectly arranged rectangles – on our computers. What I realize about our trip, as I sift through these images, is that I wasn't just "seeing the world", I was actually watching the miniature shifts that signal a girl's journey into womanhood, set against a backdrop of another world.

The truth is, she was the one who kept us from getting lost each time we rode the metro in a new city. She was the one to tough it out in the same clothes for the first three days and nights while the airport recovered her luggage. She was the one to figure out we'd spent two hours trying to start the rental car in *second*

"... I was actually watching the miniature shifts that signal a girl's journey into womanhood, set against a backdrop of another world. "



Monasterio de San Juan de los Reyes in Toledo, Spain



Brussels, Belgium

gear. She was the first one to go "birthday-style" on that nude beach, and she was the one who kept *me* company and kept me sane. I can't deny any of it; the pictures tell the whole story.

This story, however, appeared to me only after I returned home and sat down with our photographs. Time and again, my daughter seemed to have posed near windows, and symbolically, the images of her, arranged in these open passages, depicted the "in-between" of her journey. Physically, her adolescent frame hovered in the open spaces, between both safety and freedom. Similarly, an inner-transformation allowed her to oscillate between what she was and what she would be.

These shots of my daughter are moments of her own realizations. I see a young lady stretching for the perfect view – one where she can see, not just with her eyes, but from her new understanding. I see a light glowing through the cut-outs around her, but also arising from within her. Maybe I'm a bit too biased to make an honest claim as to the significance of my own daughter's image, but I could swear, it almost looks like she's about to take flight.

CREATIVE

Now and Then by JAKE CUFFE

There are thousands of deviations to the literary journey. However, they all share a commonality. Each story, passage, or poem involves relationships. Relationships and how they unravel over time. The rocks we may roll over, the streams where we get wet, and the wholes that lie ahead. And lo, they all reach an end, be it of great triumph or tragedy, it is the journey we remember. It is the journey we cherish. For what lies between now and then is an extraordinary journey. Be bold enough to start it, and you will be strong enough to finish it.

Untitled by ATZIN CARDIEL

I looked at her,

And saw all the ways a soul Can bruise, and I wish I could Sink my hands into her flesh And light lanterns along her spine So she knows that there's nothing But light when I see her.

Genesis Chapter One from the novel *Genesis*

by MONDANA BATHAI

hen Eric Cauldman entered his office that afternoon, Jude Loewe was in the middle of wiping data from several different external drives. A holo-vid playing on the corner of Jude's desk was showing an attractive woman standing outside of a building, barriers behind her with the word caution printed in a jarring black over yellow.

"Loewe, are you any closer to figuring out the vocals? They're starting to look real enough, but all the silent staring, and jerky movement, is giving everyone in development the heebie-jeebies." Cauldman shuddered and plopped his rounded girth into a chair. Jude gave the man a crooked smile from across the desk and interlaced his fingers together, knuckles going pale.

"Eric," He paused, and studied his friend. "Do you ever wonder if what we're doing is," He cut himself off for a moment before continuing. "Unnatural?"

Cauldman's bushy brows crept up his forehead and then down into a furrow. "No. We're doing it because we're scientists, and God knows that the natural state of science is always toward progress." Cauldman studied Jude in concern. "Is it ethics you're worried about? Look, Loewe, leave the ethics to the politicians. We're making miracles here. History will have us down as the guys who made life with their own bare hands."

"And some scraps of metal." Jude said wryly.

"And don't forget the synthetics. I'd say it's a step up from clay and dust, eh?" Cauldman's grin faded as the newscaster's voice filtered in.

"...Linking questionable business practices with what is being called the most perfect string of murders of our time. It appears this sinister savior is killing the rich to feed the poor. Local authorities have no new leads, and Commissioner-"

"Vid off." Cauldman ordered gruffly, and the holo-vid disappeared. "Last thing anyone needs is to listen to the news."

Jude continued to stare where the vid had been playing, an odd look on his face.

Cauldman cleared his throat, his gaze sweeping over Jude's barren bookshelf and desk."Redecorating?" He murmured, and then brushed away any answer Jude might have made. He watched the lonely tablet on Jude's desk. The small screen was cycling through a series of still pictures, each one featuring the smiling face of an attractive young woman with long wavy hair. Cauldman looked up at Jude to find the man fiddling with the gold band on his left hand.

"Jude, we all know things have been tough since the accident." Jude took a breath, and Cauldman held up a hand in peace. "I'm not saying it should be easy. Nothing like that should ever be easy. God knows you took it a lot better than anyone less might." He pointed at Jude. "But don't let anything keep you from doing what you were born to do."

When Cauldman left his office, Jude was still contemplating his words. He glanced at his computer screen, words and images floating in the air for only his eyes to see.

"Computer, erase all remaining data on Project Genesis."

"I'm sorry, but I cannot take any requests at this time. Please try again, later." A cool female voice responded.

"Computer, erase all-"

"I'm sorry, Mr. Loewe, but-"

"Forget it!" He leaned forward and manually entered his command, watching as files began to disappear.

That done, he grabbed the tablet from his desk, eyes lingering on the happy smiles. For a moment, life had been full of color. He shut off the tablet and collected his belongings. A slow pressure began to build somewhere behind Jude's eyes, and it only intensified on the drive home. The sun was still valiantly extending the last of its light, and the final pieces of Jude's courage appreciated the effort.

"...With no leads on the investigation, local authorities are advising all residents in the upper city to be on the lookout for any suspicious behavior. A curfew is pending..."

Jude shut off the engine to his vehicle and sat slumped in the driver's seat. He rubbed at his eyes, his glasses popping up from his nose. A nose with character, his wife used to say with a smile. He wasn't sure what kind of character she had seen, but he



Rice Fields by the Sea TINA HUANG

"He wasn't sure what kind of character she had seen, but he wasn't so confident about the one peering back at him from his rear view mirror. "

wasn't so confident about the one peering back at him from his rear view mirror.

Steeling himself, Jude made his way up the walkway to his tidy suburban house. His neighbor gave a friendly wave and he raised his hand in reply. Despite his shaky breaths, his long strides ate the distance to his front door. A soft breeze ruffled the autumn leaves strewed across the ground, and children were safe inside their homes, every one of them probably on the newest virtual reality headset.

Jude's hands shook as he keyed in his code, his front door opening with a, "Welcome home, Jude." He took a deep breath, took another, and made sure to step over the threshold of his house.

Staying hunched for a moment, he listened to the sounds of dishes being washed, smelled what he knew would be a perfect dinner, and felt as something in his chest tightened and twisted. There was no sound of the holovision being played, no music, no humming. There was no life in this house.

Looking around as though he were a stranger, Jude noticed the lack of pictures on the walls. There were personal decorative touches here and there, little mismatched odds and ends that his wife had enjoyed collecting. Somehow, they all came together to make a home. Or maybe it isn't objects that make a home, but the people. Because it certainly didn't feel like home now, and the only thing missing was her.

Jude paused at the door to the kitchen, and felt the same shock he always got when he saw her standing there. Her back was to him as she dried her hands, her hair a glossy riot. Slowly, she turned to him, and the sunlight filtered in through the window behind her. There used to be a smile waiting for him, not the same, but present, nonetheless. But time erases all, and it took care of that little warmth, too.

"You know, we do have machines to do the washing up, as well as the cooking." He said with a squint and a small smile, and corrected himself. "Of course, you always insisted on doing things the old fashioned way." He took a moment, looking away and blinking his eyes. "I meant she. She always insisted."

She said nothing, and he wasn't expecting an answer. He couldn't make out her expression in the glare of the light, but she seemed to be regarding him as warily as he was her. Did he detect a trace of sadness in her gaze? Impossible to know, but in that moment, he found that he would have liked to.

Nodding to himself, Jude's eyes caught the movement of her fingers as they played with the wedding ring on her left hand. She continued to watch him in silence. There was too much silence for the space to contain. He spun back into the hall and up the stairs, stopping to grab a pair of scissors from the upstairs bathroom, and slowly made his way to the attic, where boxes upon boxes of heartbreak were packed away. Taking a deep breath, Jude searched until he came upon a smaller box labeled "pictures." He settled on the dusty floor and prepared to let history cut into him.

Colors, both bright and beautiful, painted small stories of their lives together, and though none of it compared to the reality, for the moment it was everything. He held her colors in his hands, his shoulders shaking, and wept regret.

Soon, he found himself sitting in darkness. The evening light had faded, taking the edge off his grief and leaving him feeling hollow inside. He looked down at the mess he had made of their memories.

"You can come closer." He said, his voice hoarse.

A creak of the floorboards, a switch of a light, and she came to stand next to him. She reached down to pick up a photograph of her likeness.

"Your namesake." He explained, pointlessly. Jude studied her. How so very alike they looked, the woman in the photograph and the one standing before him. Did he begin to see some subtle differences? A deeper dimple, a variation in eye color, a softer mouth? No, his hand had been perfect.

But, perhaps, in his grief, he had created a figure more perfect than the reality. In doing so, he had destroyed all of the things he'd loved in her.

"Esther." The figure spoke for the first time, voice smooth and rich, and Jude startled. "Her name was Esther, and she liked to dress in every color of the rainbow."

"Yes," Jude whispered. "Her name was Esther, and I loved her in all of her colors. I made you so that she could go on living. But you're not Esther."

All of her colors slipped through his fingers like water; the more he tried to hold onto her, the more she trickled away. His rainbow girl. Her tears and her laughter were his raindrops and sunshine. He had told her so. In those days, she would laugh and tell him that she couldn't do clouds or clear skies, but give her a hose and she might manage a rainbow or two.

Jude sighed and stood to face the figure next to him. She was regarding him with a blank expression on her face.

"I'm sorry. You were never meant to be, but I made you anyway." He took a deep breath. "Esther is gone. But you are here, and while you'll never be human, you should live as who you want to be." He stuck his hand out for a handshake. "Hello, my name is Jude. I've spent my life working towards creating the perfect android, and I've failed miserably. And your name is?"

Eyes wide, she looked at his hand. Her mouth curved into the beginnings of a smile and she reached out to take his hand.

"Hello, Jude. My name is Genesis, and I'm going to change the world."

There can be no rainbows in the absence of light. But only in the absence of light can the stars shine.

ACADEMIC

EXCERPT Effect of Differences in Communication Culture On International Students in American Universities by JINA MINJUNG LEE

The form of speech adapted by Americans did not begin within America, but across the Atlantic. The technicalities of public speaking originated from the Greek sophists—the equivalent of private tutors in today's society—of the fifth century B.C. (McCroskey, 1968). During this era, sophists focused on "the ability to speak effectively with eloquence, or with a memorable style" (Aitken, et al., 2003). In addition, Aristotle formulated *The Rhetoric*, which discusses the speaker, the audience, and the speech, and focuses on providing significant content, and forms the foundation of persuasive speaking today (Aitken, et al., 2003).

Later, in the 1500s, the eyes of the British were opened toward rhetoric as the English language developed, which eventually lead colonists of the American Revolution to produce eloquent speeches to persuade both Americans and the British for independence in the 18th century. Even after the Revolutionary War was over, the practice and value of public speaking continued to flourish. This emphasis on public speaking is now bounded in American culture, encouraging Americans to share ideas or confidently refute and support a belief as their forefathers did.

Contrary to American development of public speaking, the Chinese and Korean form of public speaking did not develop from the idea of speech-making. Instead, their style of speaking is based on their cultural values mainly derived from Confucianism, which has been the central doctrine of Asia for many years. As June O. Yum explains, "[Confucianism] was adopted as the official philosophy of the Yi dynasty for 500 years in Korea... and of many dynasties in China" (Yum, 1988). Thus, it can be concluded that the teachings of Confucius impacts everyday lifestyle and cultural values of the Chinese and South Koreans, and, therefore, also has an impact on their communication style.

Confucius's style of communication reflects his teachings. One of his core values, maintaining relationships, is embedded in Confucianist speech. As Yong S. Park explains, the purpose of speaking in Confucianism is "to develop and maintain harmony within relationships rather than pursuing the outcomes that may come out of having relationships" (Park, et. al., 2008). This is a different approach than in the West, where structured speech is used for persuasion. The focus on benefiting a relationship rather than oneself may be derived from the way an Asian society considers the well-being of the community over the well-being of an individual (Yum, 1988).

The second main idea of Confusianist style of speech is silence. Confucius believed that one should be careful with his or her speech and that it is, therefore, better to remain silent. His appreciation for silence extends to how one should communicate. In one of his analects, Confucius states "Hear much and put aside the points of which you stand in doubt, while you speak cautiously at the same time of the others" (Legge, 1867). This is contrary to the Western belief of speech, where they are taught to refute what they do not believe in. The idea that speech should not be used to debate is strengthened by Wu Xiaoming, a lecturer from the University of Canterbury who interprets Confucius's teaching by stating, "speech should not be used to argue in order to reach or reveal truth, but should only be used to confirm what has already been done" (Xiaoming, 2009).

These differences in the history and value of public speaking in the United States and Asia account for the differences in their practice of public speaking. One way to divide the two styles of speaking is through W. B. Gudykunst's representation of communication, as explained by Yong S. Park and Bryan S. K. Kim. According to Gudykunst, communication style can be categorized as high or low context communication. High context communication includes "being indirect, inferring meaning, interpersonal sensitivity, using feelings to guide behavior, and using silence," while low context communication includes "being dramatic, dominant, animated, relaxed, attentive, open, friendly, contentious, and impression-leaving." Park and Kim conclude that Americans and Europeans, who have the same root of public speaking, follow low context communication, whereas Asians tend to use high context communication (Park, et. al., 2008).

Low context communication is noticeably prominent in American society, as it is an American characteristic to love impact, emotion, and passion. The goal of an American speech is to impact and persuade the audience, and is strongly influenced by individualism, one of the core value of Americans, which pushes them to communicate their opinion and belief to others. Innumerable articles on speechwriter Jon Favreau, posted after President Obama's compelling inauguration speech in 2008, are good examples of Americans' appreciation for speeches that carry low context communication traits (Parker, 2008).

If the American way of speaking is active, then the Asian way of speaking can be considered passive. Asians follow high context communication, indirect and inferred. This style of communication is possible because, unlike the diverse American culture, Asian countries tend to be mainly homogenous. According to Max Fisher of Washington Post, Korea is one of the most homogenous nations in the world, with China also on the homogenous side of the spectrum, though less so than Korea (Fisher, 2013).

Thus, when a culture is homogenous, indirect communication is possible. J. Cesar Felix-Brasdefer presents John Searle's explanation of indirect communication by stating

"Because the community looks the same, eats the same, and has the same ancestor, one can expect others to behave the same way and have the same values..."

ACADEMIC 16



it is when "the speaker communicates to the hearer more than he actually says by way of relying on their mutually shared background information, both linguistic and nonlinguistic, together with the general powers of rationality and inference on the part of the hearer" (Felix-Brasdefer, 2005). Because the community looks the same, eats the same, and has the same ancestor, one can expect others to behave the same way and have the same values, making high context communication possible.

Therefore, these differences between high and low context communication create barriers during social interaction between Asians and Americans. When an Asian immigrant accustomed to high-context communication in a Confuciusinfluenced community interacts with an American, he or she may find miscommunication abundant and misrepresentation inevitable, because high context communication is difficult in such a diverse nation such as the United States. Thus, to mitigate these barriers between Asians and Americans, the first step is to bring awareness to them of the cultural differences in their speech. By doing so, both sides can be flexible and overlook certain cues of "incorrect" communication methods, whether that be in the context of work, school, or everyday life. In time, they can bring down these barriers, aiding in an immigrant's transition into America and bringing both communities closer.

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EXCERPT Smartphones: Slowly Stopping Superior Socialization by JASON RAMOS

As someone who has grown up without a smartphoneor even a cellphone that could text—I have noticed some of the effects that smartphones have on other college students' ability to socialize. Whenever I hang out with my friends, their attention is always split between their smartphones, the virtual world, and the people around them, the real world. It feels as if only their physical presence is fully there in the real world and that their mind is wandering off in the digital realm of their smartphone and causing them to not be fully present. It is not possible for them to be satisfied by just those around them; they always need to be connected to others who are not around, interacting with as many people as possible. Until recently, I always thought I was just looking too much into it and was imagining these feelings, but I now understand that it is an actual problem affecting college students as smartphones become more ingrained into their social behavior.

While the Internet is an amazing enabler of social interaction, Digital Natives'—"[N]ative speakers of the digital language of computers, video games, and the Internet" (Prensky 4)—near universal use of smartphones, which connect them to other Natives via Internet, is damaging their social connections. Natives rarely, if ever, are disconnected from their smartphones in social situations. Sherry Turkle, in *Alone Together*, claims that "[smartphones have] become like a phantom limb, it is so much a part of [young people]. These young people are among the first to grow up with an expectation of continuous connection" (Turkle 12). This inability to be disconnected from their smartphones cause Natives to be, in Turkle's words, "alone together." That is, they are physically in the same room, but their minds are off in the digital world of their smartphones, which leads to them having little social interaction in the real world.

These Digital Natives, whose lives function through the use of smartphones, are starting to have reduced quality in their social interactions because their attention is always divided between their smartphone and the people they are physically with. In their 2008 essay, "Your Brain Is Evolving Right Now," Gary Small, a professor at UCLA, and his wife, Gigi Vorgan, argue that "Our high-tech revolution has plunged us into a state of continuous partial attention, which software executive Linda Stone describes as continually staying busy—keeping tabs on everything while never truly focusing on anything" (Vorgan/ Small 91). By always having access to smartphones, Digital

"Natives rarely, if ever, are disconnected from their smartphones in social situations."



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Natives are often distracted, causing them to rarely give their full attention to the people they are around in social situations. Instead, they split their attention between their smartphones and their friends or, in some cases, completely ignore those who are around them in the real world to focus only on the digital world. This distraction takes away from creating stimulating social interaction and stronger friendships and instead leads to people staring at their phones while not making strong connections with each other.

In the end, Digital Natives need to change their social behavior by putting their smartphones down, looking at their friends around them, and seeing that those connections are more important than the weaker ones they are making through their smartphones with people they hardly know or see. They need to start socializing without their smartphones as soon as possible and change the way they socialize, because there will eventually be a point where the use of smartphones will be so ingrained into their behavioral patterns that it will be almost impossible for them to go back, causing them to forever lose the chance to make connections that truly matter with the people physically around them.

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EXCERPT Molecular Modeling of Oxygen Binding to Normal Hemoglobin and Hemoglobin M Mutants by PING-HUA APRIL CHEN

Proteins are essential biological macromolecules that have diverse functions within living organisms. Human beings have about 100,000 different proteins, each with specific structure and function [1]. This project will use hemoglobin protein, an oxygen transport protein, to address the relationship between protein structure and its function. For hemoglobin to function, heme groups, non-protein iron-containing organic moieties, are bonded to hemoglobin [2]. When the shape of hemoglobin changes due to mutation, hemoglobin may lose its ability to bind to heme groups or oxygen. Four hemoglobin mutants of M type were selected as the models for structural and functional comparison. In these mutants, histidine amino acids at either proximal sites or distal sites are replaced by tyrosine amino acids. Thus, they were divided into two groups for comparison, group A contains variants with the distal site, including hemoglobin M-Boston ($\alpha_{58}^{\text{His->Tyr}}\beta$) and hemoglobin M-Saskatoon ($\alpha\beta_{63}^{\text{His-}}$ $^{>Tyr}$), group B are mutants with the proximal site, which includes hemoglobin M-Iwate ($\alpha_{87}^{\rm His>Tyr}\beta$) and hemoglobin M-Hyde Park $(\alpha\beta_{87}^{\text{His->Tyr}})$ [3,4]. Since they all have the same amino acid substitutions at their similar sites, I first expected mutants of each group to express similar characteristic of oxygen affinity. Interestingly, they demonstrate almost the opposite. In group A, Hb M-Boston shows decreased oxygen affinity, whereas Hb M-Saskatoon has increased oxygen affinity. As for group B, Hb M-Iwate shows decreased oxygen affinity, like Hb M-Boston, whereas Hb M-Hyde Park has almost the same properties as normal hemoglobin [3]. To interpret the relationship between mutations and hemoglobins' function in this particular result, I further hypothesize that the differences of the distance between amino acids and heme group lead to the differences of oxygen binding affinity. To test my hypothesis, I will use hemoglobin sequences, Molecular Modeling Database (MMDB)[5], and Swiss-PdbViewer accessed from National Center of Biotechnology Information (NCBI) to model the structure of hemoglobin variants.



Fig. 1. Oxygenated hemoglobin A, Cn3D [6].(A) The proximal histidine.(B) Heme group.(C) Oxygen molecule.(D) The distal histidine.

Protein Function

To perform their various functions, most proteins are required to bind to other molecules. For instance, when an enzyme catalyzes a reaction, its specific region, called an active site, binds to a certain molecule (substrate), resulting in a conformational change. As for hemoglobins, in order to transport oxygen from the lungs to the capillaries[13], they have to bind to heme groups so that oxygen can bind to the ferrous irons at the center of the heme groups. For normal hemoglobin, the proximal histidines (F8) are covalently bonded to heme groups, and on the other side of heme groups, the distal histidines (E7) coordinate heme groups [13]. In alpha chains, the proximal histidine is the 87th amino acid, and the distal histidine is the 58th amino acid; in beta chains, the proximal histidine is the 92nd amino acids, and the distal histidine is the 63rd [14]. Hemoglobin is composed of four subunits and four heme groups, and thus, it can bind to four oxygen molecules (O2). When a subunit binds to an oxygen molecule, it will increase the oxygen binding ability of the other subunits. Such a phenomenon is called cooperative binding [15]. Also, the binding of the first oxygen to hemoglobin pulls the iron toward the plane of the heme ring, transiting the hemoglobin from the low-affinity T state to the high-affinity R state [15].

Methods, Results, and Discussion

To understand the complexity of proteins, it is essential to analyze protein structures. The first step in protein structure analysis is the determination of its primary structure, namely the sequences of amino acid residues. The amino acid sequence of a protein is encoded by DNA. When mutation occurs, it often involves changes of one or more amino acids within a polypeptide chain. That is, mutation may change the primary structure of a protein, which in turn affects its 3-D structure. In this project, I selected four hemoglobin variants with single mutations as experimental groups to compare their structures and functions to a control group, normal adult hemoglobin. Since the structures of selected variants, hemoglobin M-Boston, M-Saskatonn, M-Iwate, and M-Hyde Park, have not yet been fully solved, I used the mutate function of a program, called Swiss-PdbViewer (Pdb), to substitute histidines with tyrosines at mutation sites of the solved HbA structure in the solution [16] to model the structure of M type variants. Subsequently, by Pdb viewer, I calculated the distance from the distal and the proximal amino acids to the heme iron. The following figures (fig. 10~15) show the E helix, the F helix, the proximal and distal amino acids, and the distance from amino acids to the heme iron of different hemoglobins. The results are summarized in table 1.



Fig. 10. Hb A α chain [16]. Up: distal his, 2.69Å; down: proximal his, 2.52Å.



Fig. 11. Hb A β chain [16]. Up: distal his, 3.16Å; down: proximal his, 2.59Å.



Fig. 12. Hb M Boston α chain [16]. Left: distal tyr, 1.83Å; right: proximal his, 2.52Å.



Fig. 13. Hb M Saskatoon β chain [16]. Up: proximal his, 2.59Å; down: distal tyr, 2.48Å.



Fig. 14. Hb M Iwate α chain [16]. Left: distal his, 2.69Å; right: proximal tyr, 1.83Å.



Fig. 15. Hb M Hyde Park β chain [16]. Up: distal his, 3.16Å; down: proximal tyr, 3.72Å.

Hemoglobin	Subunit	Mutation Site		Origin	Substitution	Distance to Heme Fe ²⁺ (Å)		Oxygen Affinity
Hb A	α	58	distal	His		2.69		
	α	87	proximal	His		2.52		
	β	63	distal	His		3.16		
	β	92	proximal	His		2.59		
M-Boston	α	58	distal	His	Tyr	1.83	-0.86	Decreased
M-Iwate	α	87	proximal	His	Tyr	1.83	-0.69	Decreased
M-Saskatoon	β	63	distal	His	Tyr	2.48	-0.68	Slightly Increased
M-Hyde Park	β	92	proximal	His	Tyr	3.72	1.13	

Table 1. Summary of the results. Data of the distances is obtained molecular modeling [6]. Information of oxygen affinity is obtained from Nishiura et al. [17]. Green: group A with distal mutation; red: group B with proximal mutation.

Although I assumed the variants with similar oxygen affinity would have the same increased or decreased distances between the normal hemoglobin and the variants as in my hypothesis, the results shown in table 1 suggest that there seems to be no clear relationship between the distances from certain amino acids to heme irons and the oxygen binding ability hemoglobins M display. The reason for this inconclusive result may be that in natural conditions, the replacement of tyrosines in hemoglobin M mutants would oxidize the heme iron from ferrous (Fe^{2+}) to ferric (Fe^{3+}), forming ionic bonds between phenolate anions of tyrosines and ferric irons [15]. Additionally, Pdb software cannot model the exact change or reaction between molecules simply by substituting amino acids, and the different states of iron presenting in natural condition and experimental condition should be taken into account. However, the experiment conducted by Nishiura et al. [17] using fully reduced hemes, namely hemes with ferrous irons, showed that all four hemoglobins M displayed high oxygen affinity. This result appears to correspond more with the data I gained with only one exception, hemoglobin M-Hyde Park. All the other three variants, M-Boston, M-Iwate, and M-Saskatoon, show that, when the distance decreases, oxygen affinity increases. An explanation to these results may be that tyrosine helps coordinate the binding of oxygen molecules. The effect is more obvious at the distal site, where oxygen molecules appear, since the distal residues are considered as the controlling agents of ligand affinity of the hemes [18]. Therefore, shortening the distances from distal tyrosines to heme irons increases the oxygen affinity.

Conclusion

After all, my hypothesis was inconclusive at the initial condition of the oxygen affinity of the four hemoglobins M as shown in table 1 due to the different states of iron ions. On the other hand, based on the same ferrous iron state used in both papers, my assumption turned out to be related to the results Nishiura et al. reported [17]. However, even though the result may seem to be reasonable, it was not accurate due to the lack of actual experiment. Proteins are dynamic within biological conditions, and hemoglobins perform conformational transit from T states to R states as they bind to oxygen molecules [18], whereas these transformations cannot be modeled via Pdb. Also, there exists discrepancy among the results reported by others. The fact is that the experimental conditions differ from person to person and even differ from the biological conditions. Such a difference is important when doing literature review but is often neglected. Moreover, the limitations of the access to information and the knowledge on specific fields also diminish the plausibility of my results. Hence, to be more valuable and reliable, my hypothesis requires further research and scientific experiments in the future.

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Spanish Steps, Rome SYDNEY RAMOS

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