NAME

<div align="center">Definitions of a Creative Person and a Creative Contribution</div>

I have always considered myself a creative person. It is a part of my identity, and it has shaped my path in life. As a young child, as my friends dreamt of becoming baseball players and firefighters, I said I wanted to become an inventor. I was constantly having ideas of inventions that would make people's lives easier. When I played with Legos, I never used the instructions; instead I would always mix the different sets together to create a car - that could also be a boat - that also had wings that folded out to fly - which had an arsenal of weapons for defense, but also turned into a base for defense. Growing up in school, I never wanted to solve answers the methodological way they taught us. I did not want to fill out the blanks in a worksheet, but to analyze the problem and see different solutions than the one answer in the textbook. I hated when teachers made us use their one method for math, when I would solve it my own way. This creativity is what lead me to the creative path of being a UX Designer. A UX Designer is tasked with analyzing User Research and coming up with innovative solutions to fill the user needs. Throughout my classes at DePaul, I have used facets of creativity to solve problems. In this paper, I will discuss how I approached and solved various situations in my professional, academic, and personal life using creativity. This will be elucidated through analysis and comparison of the facets of creativity and creative works as understood in scholarly works.

When one thinks of creativity, one usually thinks of the common dictionary definition which is "The use of the imagination or original ideas, especially in the production of an artistic work" (Watson, 20). One usually thinks of creativity as an inborn trait, that one can tap into at certain time. However, Robert Sternberg, one of the top 100 psychologists of the 20th century

and one of the leading psychological authorities on creativity, takes it a step further. Sternberg actually believes that creativity is an acquired habit, that one habitually uses throughout life. In his words, "Creativity becomes a way of life that one regularly utilizes so that one is hardly aware one is engaging in it" (Sternberg 3). Sternberg explains that though creativity is thought of as a novel inspiration one sometimes gets, creative people just "Habitually respond to problems in fresh and novel ways, rather than allowing themselves to respond mindlessly and automatically" (Sternberg 3). Like any habit, Sternberg says, creativity has three components which encourage this habit: many opportunities to be creative, encouragement when one is acting creative, and rewards when one comes up with a creative solution.

Sternberg has written many papers and books on creativity over the years which have been widely accepted in the psychological world. Sternberg has developed two major theories of creativity, The Investment Theory of Creativity and the Propulsion Theory of Creative Contributions. In the Investment Theory of Creativity, Sternberg describes the characteristics of a creative person and how to assess it. In the Propulsion Theory of Creative Contributions, Sternberg defines the types of creative contributions.

The Investment Theory of Creativity

In Sternberg's paper, "The Assessment of Creativity: An Investment-Based Approach"*,* Sternberg summarizes his Investment Theory of Creativity, which he developed over time in many papers and books.. He first explains how creativity is a habit, as mentioned above. Sternberg says that there are four habits which creative people have, which are similar to habits of investors. They: "(a) look for ways to see problems that other people don't look for, (b) take risks that other people are afraid to take, (c) have the courage to defy the crowd and to stand up for their own beliefs, and (d) seek to overcome obstacles and challenges to their views that other

people give in to, among other things" (Sternberg 4). A creative person does not just occasionally come up with an idea, a creative person has a certain set of characteristics which they utilize to consistently approach problems.

Sternberg's theory postulates that creativity is a "decision to buy low and sell high in the world of ideas" (5). This means that creative people consistently are willing to make decisions that are unknown or against the tide, but have potential for high success. The creative person, Sternberg says, is someone who has the gumption to persist again and again with ideas that are unpopular and are willing to keep defying the norms.

Sternberg's theory also explains that there are six characteristics and resources that a creative person requires: "intellectual abilities, knowledge, styles of thinking, personality, motivation, and environment" (5). The creative person has to make decisions to use these resources available.

To explain intelligence, Sternberg refers to the *Cambridge Handbook of Creativity* which he edited together with renowned professor and authority on creativity James Kaufman. Chapter 21, authored by Bonnie Cramer, Kyung Hee Kim, and Joyce VanTassel-Baska discusses "The Relationship between Creativity and Intelligence" (Sternberg and Kaufman 395). They say that intelligence is required for creativity, but intelligence alone is not enough. In particular, three facets of intelligence is required for creativity: "(a) the synthetic ability to see problems in new ways and to escape the bounds of conventional thinking; (b) the analytic ability to recognize which of one's ideas are worth pursuing and which are not; and (c) the practical–contextual ability to know how to persuade others of—to sell other people on—the value of one's ideas" (quoted in Sternberg 5). In order to be creative all of these intellectual skills are required,

because a creative person needs to first think outside of the box, discern what has value, and then sell that idea to the next person involved in making that idea into a reality (Sternberg 5).

Knowledge is the next requirement of creativity. For if one does not have any knowledge in the field that they are being creative in, then they have nothing to use to be creative about. The more they understand about the field, the more they have to work with to move it forward. However, too much knowledge can make one set in their way, and lose the ability to think outside of the box. Sometimes, a new perspective must come from outside, or someone must truly be willing to put down their preconceived notions (Sternberg 5).

One must also have a particular thinking style to be creative as well. Sternberg explains that there are three thinking styles, parallel to the legislative, executive and judicial branches of government ("Theory of Mental Self-Government: Thinking Styles"). Here, Sternberg believes that the legislative style of thinking is required for creativity. Legislative style of thinking means that one has a preference to create and think of new ideas. This is different than being a creative person; for one can prefer to think of new ideas, but not actually be good at it (Sternberg 5)

Sternberg also believes that one needs to have a particular personality to be creative. He bases this off studies conducted on this matter including Gregory Feist's chapter in the *Cambridge Handbook of Creativity*. According to Feist:

> These biological markers in tum make the emergence of higher levels of certain
> personality traits more likely. The cognitive traits (openness and cognitive flexibility),
> social traits (norm-doubting, nonconformity, independence, extraversion-introversion,
> aloofness, hostility, coldness, and dominance, self-confidence/ arrogance), motivational-
> affective traits (drive, persistence, intrinsic motivation, and positive affect), and clinical

traits (psychoticism, latent inhibition, and schizotypy) all function to make creative

thought, behavior, and achievement more probable. (125)

These attributes contribute to the personality of one who is willing to go against the flow. This is

integral for someone who can 'buy low' on an idea (Sternberg 6).

Additionally, a creative person needs motivation. Sternberg brings Teresa Amabile's

research to show that one requires intrinsic motivation to be creative. Amabile's research

demonstrated that innovation and creativity declined during a period of downsizing (Amabile

and Conti 634). This is because creativity most often occurs when one is doing what one is

passionate about, and not focused on an external reward (Sternberg 6).

Finally, one needs to have the right environment to be creative. Even if one has all the

above resources, if one does not have a supportive environment to accept and encourage creative

ideas and solutions it will be very difficult to succeed (Sternberg 6).

With a combination of the above traits and resources, one can be a successful creative

person. Can one be a creative person with only a few of these characteristics? Yes, but it will be

a lot more difficult to be successful.

Propulsion Theory of Creative Contributions

Sternberg also proposed the Propulsion Theory of Creative Contributions, together with

Kaufman and cognitive psychologist Jean Pretz. The theory "seeks to delineate the different

ways in which contributions can be creative" ("Propulsion Theory of Creative Contributions").

Sternberg delineates eight different types of creative contributions. The first four "move forward

in an already existing direction" ("Propulsion Theory of Creative Contributions"), and the last

four are a new direction of previous work.

The four types of creativity that are a progression of a pre-existing direction are: 1) conceptual replication - taking an existing work, and replicating it in a new form, for example if someone recreated an artwork done with watercolors with oil paints; 2) a redefinition - when someone takes an idea used for one thing, and uses it for a different purpose, for example if someone takes a water bottle and repurposes it as a new kind of spray paint canister; 3) forward incrementation - is the next progression in a series of ideas, for example the next book in a set or the newest iPhone; 4) advance forward incrementation - this is the next progression of an idea but it is a major leap, for example a self driving car ("Propulsion Theory of Creative Contributions"). The first three are not such a monumental change, so they will not face opposition from stakeholders; but advance forward incrementation may face some wary stakeholders.

The four types of creativity which are a new direction of previous work are: 1) a redirection - this is a move which turns a field in a new direction, for example the UX revolution which changed design from being design focused to user focused; 2) a regressive redirection - when someone moves forward an idea which is from the past, for example if they started to make phones foldable again; 3) reinitiation - an idea that does not just move a field in a new direction, but it makes a field start anew, for example what self driving cars would mean to cab driver field; 4) synthesis - when someone combines separate ideas into one idea, like a camera-phone. These four ideas are very scary and threatening to stakeholders and members of the field, as they can make previous ideas and jobs obsolete ("Propulsion Theory of Creative Contributions").

Professional Use of Creativity

In my life, I have had many experiences using the characteristics that make up a creative person to create creative contributions. I will start with my current job. I am currently a research

assistant in the Technology for Social Good Research and Design Lab at DePaul. My main role is to design data visualization dashboards to help mentors individualize learning and mentoring to their students. A data visualization has a lot of room for creativity. Many times, people just suffice with a bar graph, pie chart or line graph. However, when someone takes really complicated data and presents it in a novel way that is very intuitive and easy to read, one can have profound insightful results. Over time at the lab, I devised many creative visualizations which enabled users to see very complex data. However, initially these were rejected, and my basic bar and line graphs were used instead. It looked like this:
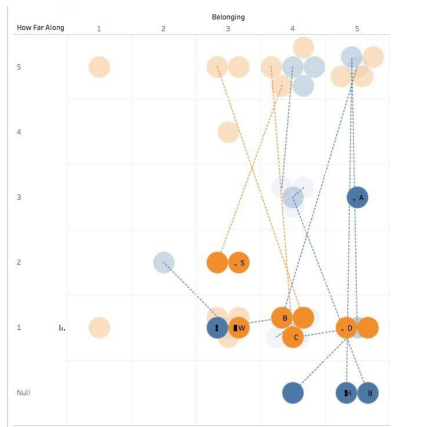
I quickly learned that with visualizations, users will quickly reject a visualization if they do not understand it right away. Therefore, future visualizations that I designed needed to be very creative, but yet easy to understand at first glance. Thus, I created visualizations that were complex and creative, yet simple to read. I used icons, and the size and placement of the icons represented the quantity of the data. These visualization were much more successful. Some of the visualizations looked like this:

Fun

6
4
2
0

Belonging

6
4
2
0

How Far Along

6
4
2
0

Week 1 Week 2 Week 3 Week 4 Week 5 Week 6 Week 7 Week 8 Week 9 Week 10 Week 11 Week 12

Pace

5
4
A little fast
3 ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶
Fine Fine Fine Fine Fine Fine Fine Fine Fine Fine
2
1

Week 1 Week 2 Week 3 Week 4 Week 5 Week 6 Week 7 Week 8 Week 9 Week 10 Week 11 Week 12

I needed most of the characteristics Sternberg posits is involved in creativity to create this. Firstly, I used the three facets of intelligence: a) "the synthetic ability to see problems in new ways and to escape the bounds of conventional thinking" to look beyond conventional visualizations like bar graphs and pie charts and understand that there are other ways to convey data; b) "the analytic ability to recognize which of one's ideas are worth pursuing and which are not" to realize which of my creative visualization ideas were worth selling (I had many ideas and experimented with creating many creative visualization, I had to decide which ones had value to move forward with), and c) "the practical-contextual ability to know how to persuade others of-to sell other people on-the value of one's ideas" to know how to convince the members of my team that these visualizations were a good idea to move forward with (every member of the team had ideas, I had to convince them that my visualizations, though out of the box, would be valuable to the mentors). Knowledge was also important, for I needed to learn principles of data visualization and cognitive theory to come up with my later visualizations which were of value. Without my knowledge of data visualization, graphic design principles and cognitive principles, I would not be able to create these visualizations. My thinking style to choose to be creative, my personal motivation to make great visualizations, and the supportive staff at the lab (there was) were all integral to my success as well here.

The Sternberg type of creative contribution here was both a forward incrementation and a synthesis. The visualizations moved forward with concepts of data visualizations, like representing data with colors, size, and placement; but it also used the interface design concept of using icons. I made the color, placement and size of the icons different based on the data.

Creativity in Class Projects

In my UX classes, I developed prototypes for a few different app ideas I had. One app I created was an app my team and I called sharedHeartbeat. The app enabled users to workout virtually with their friends while listening to music personalized to their heartbeat and the group. Here is my scenario concept representation of the app:

John leaves his house to start jogging, opens the sharedHeartbeat app on his phone, and selects "Virtual Group Workout". It is 6:30, the time that he and his friends jog virtually together. He looks in the "Workout Room", and sees that his old college buddies have already checked in. Jane in England, Jerry in Los Angeles, and Jim in New York. John clicks "check in", and suddenly he hears all his friends chatting over the conference call. "OK wussys ready to start?" he hears Jane say. "Yup," he responds. They all click "Begin Workout" and the music starts playing. John starts jogging. "I love this song!" Jim says. "Yeah", Jerry agrees, "it's awesome how the app finds songs that we all have liked". Fifteen minutes later John is panting heavily. "Come on slowpoke, exhausted already?" Jane taunts. "Don't worry, I'll be running long after you've finished", John responds, "besides, if you check the scoreboard, you'll see that I've run 3 kilometers, while you've only run two!" Twenty minutes later, John arrives home after a great workout. The app posts to the newsboard the details of the workout John and his friends did. As John takes

a big gulp of water, he scrolls through the newsboard and checks out the other workouts

that all his friends have done.

In order to design the app, I needed to synthesize and analyze the results of user research interviews and observations. From the insights that I gleaned from the research, I came up with these ideas which addressed the user needs I observed.
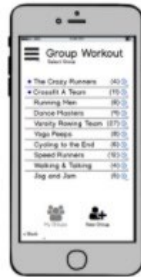
After the user selects group workout, the user has the option to go directly to a group workout, or make a new group...

The user can then choose what type of group workout...

The user then chooses from his/ her contacts which participants to add to the group...

After the user selects create group, a pop up prompts the user to name the group...

This brings the user to the group workout. The user can then see the status of the other participants, can join the group phone chat, listen to the automatically generated playlist of songs all the participants have liked, and control the music. The user can also select to add participants...

This allows the user to add other participants to the group.

In this project as well, I used most of the characteristics that a creative person utilizes. I needed the intelligence to synthesize and analyze data, and appreciate which ideas were of value. I then needed to have the personality to push my ideas to my teammates, and the intelligence to display and convince my team that my ideas were of value. Knowledge was integral here. User Experience Design - the field I am pursuing a career in - is centered around gaining knowledge of the users. Based on my knowledge of the user's workout and music habits, I was able to

conceive of this idea. Without this knowledge here, I would just be making some uninformed guesses of the user's needs.

A legislative thinking style and motivation was actually part of the assignment. Our task was to be creative and make an app for the users. However, many of the teams, did not actually create a new concept in terms of a creative contributions. The teams just made apps that solved the user's needs, using concepts that already existed. For example, they enabled users to create playlists for different types of workouts. This would be considered a creative contribution as a conceptual replication, but it did not go further.

The type of creative contribution for my app, I would best describe as a synthesis. There are apps that allow people to collaborate, apps that allow people to compete in workouts, apps that personalize music, and apps that play music to a rhythm. This app just joined them all together.

Creativity in My Home

I utilized creativity to design and layout and furnishing of my apartment. One item in particular I am proud of is a kitchen island I created. I saw that we had very little storage and counter space in our kitchen, while the kitchen actually had a decent amount of area. I therefore decided to get a pantry and a kitchen island. Both of these were exorbitantly expensive, so I needed to come up with another solution; I built them myself. The kitchen pantry I built from scratch. I described the whole experience of building that in my externship project at DePaul. The kitchen island required a bit more creativity. I found a place that was giving away free used office desks. I realized that I could convert one of the desks into my kitchen island. After doing research on the components of a kitchen island, I was able to turn this into this:

It required me adding knobs, a towel rack, a base and a countertop. For the base, I used wooden fence post caps beneath a board, and for the countertop, I used floor tiles. With a little bit of wood paint, it fit perfectly in our kitchen.

In regards to creative characteristics, it started with intrinsic motivation to have more counter space, it was my thinking style to look for creative alternatives that lead me to decide to make it in my own way, and my intelligence which allowed me to see a new way of making it. My personality here may have been the most important characteristic of creativity used here. This is because when I came up with the idea, my friends and family said that it would not look good, nor be useful. My stubborness to push against the tide kept me going. Actually, my environment also was crucial here, as my wife was supportive and encouraging of my ideas. In terms of creative contributions, this would be a redefinition, as it is a reuse of a desk for a different purpose.

Creativity in My Day to Day Life

In my day to day life, I am constantly using creativity to make my life easier. To give one example, would be a contraption I made to feed my son. I was trying to be a stay at home dad while I had finals for school. Holding the bottle for twenty minutes while he fed was very time consuming. Thus, I created a contraption to hold the bottle. A string was holding the bottle from

many sides to ensure it was in the perfect position. It was tied to the car seat which rocked. This

enabled the bottle to bob up and down with the sucking. Here is a picture of the contraption:

The creative characteristics I used here again starts with motivation to make my life

easier, the legislative style of thinking to prefer to come up with new ideas, and the intelligence

to contrive such a device. The type of creative contribution here might here be an advance

forward incrementation, as it takes baby bottle technology, and advances it to a way further level.

Moving Forward

Now that I have seen the delineation of the various types of resources a creative person

has, I see what I need to work on if I want to be successful as a creative person. I have not had

much opposition in my life to my creativity, as I have not had much real life experience with

pushing forward a creative idea in a professional capacity. It takes a defiance and willingness to

go against the tide and be creative, so I will fortify myself to strengthen this personality within

me. I will choose to make strong choices for ideas that may seem insignificant to others, but that

I see its value. This is the buy low and sell high of creativity.

Works Cited

Watson, Scott. *Using Technology to Unlock Musical Creativity*. New York: Oxford University

Press, 2011.

Sternberg, Robert J. "The Assessment of Creativity: an Investment-Based Approach." *Creativity

Research Journal*. 24.1 (2012): 3-12. Print.

Kim, Kyung Hee, et al. "The Relationship between Creativity and Intelligence." *The Cambridge

Handbook of Creativity*, edited by James C. Kaufman and Robert J. Sternberg,

Cambridge University Press, Cambridge, 2010, pp. 395–412. Cambridge Handbooks in

Psychology.

"Thinking Styles." *Robert J. Sternberg*, www.robertjsternberg.com/thinking-styles/.

Feist, Gregory J. "The Function of Personality in Creativity." *The Cambridge Handbook of

Creativity*, edited by James C. Kaufman and Robert J. Sternberg, Cambridge University

Press, Cambridge, 2010, pp. 113–130. Cambridge Handbooks in Psychology.

Amabile, Teresa M., and Regina Conti. "Changes in the Work Environment for Creativity during

Downsizing." *The Academy of Management Journal*, vol. 42, no. 6, 1999, pp. 630–640.

JSTOR, JSTOR, www.jstor.org/stable/256984.

"Creativity." *Robert J. Sternberg*, www.robertjsternberg.com/investment-theory-of-creativity/.

"Shared Heartbeat." *Eliyahu Saul's Portfolio*, eliyahusaul.com/sharedHeartbeat.html.