More than Paradoxes to Offer: Exploring Motivations to Attract Women to Computing

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ABSTRACT

The question we raise in this paper is why some women choose not to go into computing. What motivates their reasons for selecting their major and occupational goals? We interviewed twelve first year women who are not majoring in Computer Science and found half had pro-social goals for their careers. When asked if participants thought that people working in computing are helping people, some told us that they hadn't thought about it before or they thought that maybe computing helped people indirectly through "business" aspects. We showed them pictures where technology obviously helped people, such as sign language translation for the deaf. Most were really interested in these pictures, and given the opportunity, thought that they would be interested in participating — they just never thought of computing or technology as helping people.

Categories and Subject Descriptors

K.3.2 [**Computers and Education**]: Computer and Information Science Education—*computer science education*; K.4.0 [**Computers and Society**]: General

General Terms

Human Factors

Keywords

gender diversity; motivation; women; image of computing; non-CS majors

1. INTRODUCTION

Joan Wallach Scott in her book, *Only Paradoxes to Offer: French Feminists and the Rights of Man* tells a story of the French feminist, Olympe de Gouges who in 1788 stated that she was "a woman who has only paradoxes to offer and not problems easy to resolve" [22, p.4]. The paradox being described is that when women enter a traditionally male field, such as the computing, women may have to diminish their contributions they can make from their possible identities as women, as individuals in their own right, in order to be perceived as "legitimate". This paradox could be a reason why some women never consider computing as a academic or occupational choice. Indeed, as illustrated by the persistence of the low numbers of women in computing, it is not a problem that is easy to resolve [25].

This paper looks at one potential way how this paradox can be negotiated such that women can be individuals, in their own right, and perhaps change what it means to be a computer scientist in the United States. Certainly there is no panacea to attract and retain women in computing. We explore the role of socialization or the learning of culturally defined gender roles. We will not delve into socialization theories, instead, we are taking a pragmatic approach and recognize that some characteristics of women exist regardless of how they were developed. We are not trying to state that all women have particular characteristics, but rather we are demonstrating that some women have some interests and desires that are currently perceived as being neglected in the field of computing. We also recognize that qualities that are deemed 'feminine' probably also exist in men, therefore; we would be wary with the claim that recognizing 'difference' perpetuates a negative stereotype. However, given the greater disparity of women in computing compared with men, the focus of this study is to investigate why women reject the field of computing.

From literature on women and motivation, we found evidence that women have pro-social goals, such as a desire to help people and society [8, 16, 15]. Taken together with computing curriculum initiatives and computing image campaigns, it seems that promoting computing as a way to help has been generally seen as a method to broaden women's participation in computing [10, 18]. It is important that these assumptions be carefully looked at, as we can see from the popular press. A recent *New York Times* article describes that content creation is on the rise among teenage girls, but it is not clear that this necessarily means that girls become technology producers [17]. We need to specifically look at the pieces of motivation in relation to educational or occupational goals, or achievement-related choices and computing.

In looking to explore some of these questions, we ask more specifically: Is helping people a major component of women's achievement-related choices? By achievement-related choices, we mean those choices involved with de-

ciding a path in education or a occupation. Are women interested in engaging in producing technology if it helps people? What roles will women be willing to play in the teaching/distribution, design, use, and implementation of technology that helps people?

In order to answer these questions, we interviewed twelve first-year women at our University who are not computer science majors. We decided to explicitly not interview computer science majors. We are interested in why women do not choose computer science and believe that this is an interesting question in itself. Since we know that most women do not choose computer science, women who are currently pursuing computer science have some how resolved the paradox and are able to align their self values with the values of computing. In the forum section of the *Communication of the ACM*, a reader, Steve McConnell, comments in response to a study on women and men in the IT profession [1]. The reader states that missing from the study is a non-IT control group. "It is not surprising that there are few differences between women and men in IT. What about differences between women and men not in IT? Or between girls and boys who have not yet made a career choice? Discovering these differences would shed more light on the question of why more women don't enter the profession in the first place." We believe this statement poignantly addresses our motivation for interviewing women who are not studying computer science.

2. PRIOR WORK ON WOMEN'S MOTIVATIONS

Several studies have focused on women's educational and career motivations. To answer the question why women are nearly equally represented in health related fields compared to the physical and engineering fields, Miller et. al. investigated the motivations of high-achieving undergraduate science students [16]. They found that women had more prosocial goals, such as helping people and society, compared to their male classmates.

Accounting for gender role socialization, women and men might be placing different values on core personal goals. In a longitudinal study of high school seniors, girls placed more of an emphasis on the importance of having a job that allows one to help others, to do something worthwhile for society, and the importance of making occupational sacrifices for one's family. In comparison, boys tended to place more value on making a lot of money, becoming famous, seeking out challenging tasks, and being involved in work that uses math and computers [13].

In a study of gifted math students, Benbow and Stanley found that gifted girls rated biological science, and both medical and social service occupations higher than did boys. In contrast, the boys specified more of an interest in high-status and business-related occupations in general including the physical sciences, engineering, and the military in particular [4].

Based on her work in *Female Friendly Science*, Sue Rosser, builds on women's studies scholarship and research and calls for "insuring science and technology are considered in their social context with assessment of their benefits for the environment and human beings may be the most important change that can be made in science teaching for all people, both male and female" [19, p. 72]. Among many recommendations, Rosser calls for science to be discussed within its social context in order to attract more women.

Concerning women in computing, in *Unlocking the Clubhouse*, Margolis and Fisher describe the women in computer science as having "counter narratives" to the image of computing [15]. These counter narratives briefly described a desire to "link computer science to social concerns and helping people." Our study explores further the desire to help people. We study women who did not choose computer science to see if, in relation to computing, those values still hold.

Zarrett conducted a cross race and gender longitudinal study of 1,482 adolescents examining their computing aspirations and found differences between the groups [28]. For African American females, higher levels of parent's education negatively correlated with whether the daughters pursued an IT career or education in IT. If African American female's parents had a high amount of education, they would be less likely to pursue a career in IT. The same correlation was opposite for African American males and not significant for Caucasian females and males. Zarrett points out that not all women reject computing, and socioeconomic status obviously plays a role concerning choice.

2.1 Eccles' Theoretical Model for Achievement-Related Choices

During our analysis phase, we found the Eccles' theoretical model for achievement-related choices to be an appropriate model to describe our interview data [8]. The model describes why a person chooses a particular path relating to achievement, such as a occupational or educational choices. According to the model, people make choices based on two major components of the expectancy/value model of achievement-related choices: their expectation of success and subjective task values. The expectation of success refers to confidence in one's abilities to succeed and personal efficacy. The subjective values is a group of four values including the (1) the attainment value, or how well the activity matches with one's self image (2) the cost of engaging in the activity, (3) the utility value or the way the activity helps the individual achieve immediate or long-range external rewards, and (4) incentive – interest or enjoyment of the activity (See figure 1.) Eccles' states that the first two subjective values are particularly influenced by gender roles or socialization.

The model has been used by Eidelman and Hazzan to describe cultural differences of Israeli women who select advanced-level computing between the Jewish majority sector and the Arab minority sector [9]. Similarly, we found this to be an appropriate model since it has been found to be an accurate prediction for the choices students make such as math [8].

In a critical review of work related to women and computing, Singh et. al. says "[to] fully employ a gender theory of the dialectical interplay of agency and structure and to guide policy changes, studies need to use both gendered notions of self and gendered environments" [23, p. 519]. Some studies have looked at the gendered environments of the computing culture. Barker's work describes a defensive, competitive, and impersonal climate in the computer science classroom [3]. A study by Cohoon looks at the gendered experiences of women graduate students in computing majors[6]. In applying the Eccles' model, we hope to start to account for

these gendered roles that are applied to the self in addition to the work that describes gendered environments.

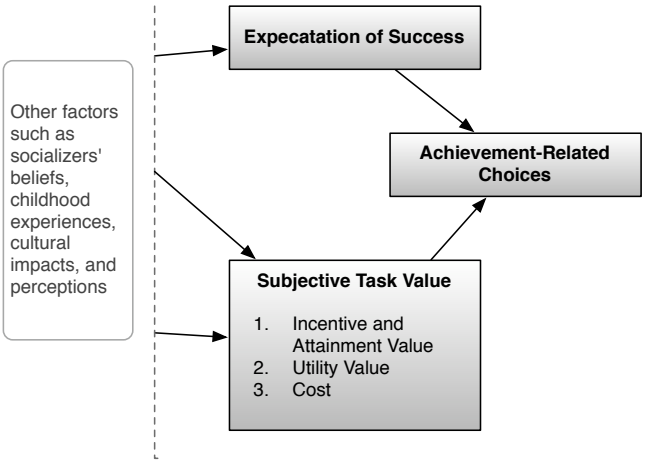

Figure 1: A portion of the Eccles' model is shown to illustrate the major components that contribute to achievement-related choices: the expectation of success and subjective task values

3. METHODS

3.1 Participants

We interviewed twelve first year women who are not majoring in computer science from our University using a semi-structured format. The student's college major breakdown can be found in the following table:

Major	*Count*
Engineering	
Biomedical	3
Mechanical	2
Aerospace	1
Nuclear	1
Liberal Arts	
International Affairs	2
Undecided	1
Interdisciplinary	
Computational Media	2

Figure 2: Participant's Major

The students' selected majors should not be viewed as being tied too tightly to their final career paths because at our University, freshmen are required to select a major upon starting school. Similar to students at all institutions, students often change their majors at least once. All of our participants were from the United States, and three of our participants were non-caucasian of differing ethnicities. Because of the small number of participants, we did not investigate the intersection of both gender and race/ethnicity.

Our University also has a unique requirement: all students must take a introductory programming course. All of the students we interviewed were just about to complete their first programming course. Due to this requirement, there are three different introductory computing courses at our University to accommodate the different majors. One course is geared towards computer science majors, one is focused on engineering students, and one is for non-majors and focuses on the manipulation of media.

3.2 Interview Structure

The interview lasted from thirty to ninety minutes and was divided into four sections: (1) How did they choose their career goals?, (2) What are their attitudes towards technology and computing?, and (3) What do they think about technologies that help people, and (4) to what extent would they want to be involved with the technologies? Responses to the first two questions were elicited using a semi-structured interview format.

To answer the last question, photos were shown to the participants that depicted a scenario where technology was helping people. The following is a list of all of the pictures used:

1. OLPC XO: The One Laptop Per Child XO laptop from MIT being used by Nigerian children.
2. A skin cancer detection machine: Skin-imaging technology that enables doctors and skin-care specialists to look beneath the surface of the skin
3. The Nintendo Wii with the elderly: A picture depicting elderly people in a nursing home playing Wii sports
4. Sign language game: A game that uses American Sign Language recognition to help young deaf children acquire language skills
5. Environmental probes: Devices attached to taxi cabs and installed on people's cell phones to capture carbon dioxide levels in Ghana. This data is then compiled and shown on a map.

Participants were asked to rank the pictures from most interesting to least interesting. Participants were then asked why or why they did not find the picture interesting. Next, the participants were given choices of how they could participate with the technology in the scenario and asked to indicate what choice sounded the most interesting to them. The four categories consisted of handing out the technology or teaching how to use the technology; designing the user interface or conducting user research; programming an application; or designing the hardware. Participants were briefed with the difference between designing the user interface versus programming. Figure 3 is an example of a picture used.

3.3 Data Analysis

The interview data was transcribed and loaded into a qualitative data analysis software. We then used an open coding phase to assign codes to participant utterances with a coherent thought being the unit of analysis. Categories were formed inductively by grouping similar codes using the visual mapping capability of the software. Properties and dimensions were then identified for each of the categories to develop relations between the categories [24].

Next, an axial coding phase was used in order to make relations between the categories and to recombine data that had been divided during the open coding phase. At this

Figure 3: The OLPC XO laptop being used by children in Nigeria – an example photo used in the interview to show an intance of technology intended to be used for pro-social goals

point, we realized that the categories fit particularly well within the Eccles model of achievement-related choices. The axial coding process helped us think about the categories this way especially pertaining to conditions that gave rise to the categories, the context into which they were embedded, and the action/interaction strategies in which they are handled, and the consequences of those strategies [24]. We applied the Eccles' model to generate super categories. We found that the Eccles model was able to explain how the data were related to each other and to illustrate how an important aspect, the attainment value, had been overlooked. For feedback on the pictures, the responses were marked and tallied based on the various questions regarding sorting, interest, and aspect of interest.

4. RESULTS

During the analysis phase, we found the Eccles' theoretical model to be an appropriate model to describe our interview data. The model helped to understand how certain values play a role in women's decision to not pursue computing. We believe that one aspect of the model, the attainment value, or how an activity matches with one's self image, has been overlooked in regards to research on women and computing. That is not to say that the other aspects of the model are not equally important, but the data that arose from our interviews pertaining to the other aspects of the model matches previous work.

We first describe how the model fits within our interview data and existing literature. Second, we describe the attainment value, or how an activity matches with one's self image, and how computing conflicts with this value. Lastly, we discuss the results regarding perceptions of technologies that actually help people.

4.1 Eccles' Model Applied to Computing

We found our interview data that corresponded with the expectation of success to match with existing literature. We found that participants viewed programming as an innate programming ability and it was just something that they did not possess. This statement was similar to Margolis and Fisher's geek gene [15] and Schulte and Knoblesdorf's innate programming ability [21].

> "Certain people are very good at computers and some of them just don't think that way. It's one of those – it's like math, you either have it or you don't really like it." – Aerospace Engineering student

> "I think some people just have an intuition for how to work through problems that way, and I just don't think I possess that at all. Like if I'm going to think through a problem, I have to really push myself to be able to do that" –Nuclear Engineering student

Also, based on their current experience with the introduction to programming course, participants viewed the programming activity frustrating. Furthermore, participants had heard that programming was hard and they were concerned over the programming course affecting their grades. All of these contribute to a negative expectation of success concerning computing.

Subjective values such as the cost, utility value, and interest in the activity also matched previous work. Concerning the relative cost, most participants did not have a good idea of what a career in computing would constitute. Therefore, the cost of pursuing computing would be high. One participant was also ashamed of admitting that she played the video game 'Guitar Hero' (Guitar Hero is a video game where players use a guitar shaped peripheral to simulate the playing of rock music.) This may indicate that pursuing computing would be costing her self image.

The utility value showed that some of the participants did not view their computing course directly assisting in their long term goals. Some participants viewed the results of their program as meaningless and was not sure how it helped them in the long-run. One participant had a lot of experience programming in high school:

> "I just didn't like sitting there and trying to program for hours or do one assignment that just the result or the output was just so small or one sentence or something. I just, I don't know how to explain. I just got so frustrated like reading Java and trying to do our assignments." –Liberal Arts International Affairs student

The same student had similar feelings towards her current computing course.

> "I go to my CS class and [I'm] like I don't need this, I don't want to take this."

Participants also viewed programming as boring and associated it with sitting at a desk all day which conflicted with their interest in interacting with people.

> "I'm a very chemistry oriented person so like definitely something with the sciences and just interacting with people. I'm a people person; I can't

> sit at a corporate desk job and not be around people." – Biomedical Engineering student

This finding is consistent with Yardi's work on teenagers' attitudes towards computing where she found that they perceived the field to be boring and irrelevant [27].

4.2 Attainment Value

The attainment value is defined by Eccles as: "We conceptualize the attainment value in terms of the needs and personal values that an activity fulfills. As individuals grow up, they develop an image of who they are and what they would like to be" [8, p. 597]. Eccles' work states that the attainment value is highly subject to gender differences because much of the self image is socially constructed. The self image also includes schemas regarding the proper roles of men and women as well as social scripts regarding proper behavior in a variety of situations. According to Eccles' work, individuals place more value on those tasks that either provide opportunity to fulfill their self-image or are consistent with their self-image and long-range goals and are more likely to select those tasks.

A category that arose from the interviews was the desire to help people and society. This category clearly fits as an attainment value. Categories that matched this attainment value included humanitarian activities, an interest in health and medicine, and volunteering. The activity of computing was generally not perceived to match this value. However, it should be noted that the mechanical and aerospace engineering majors did not display the desire to help people to the extent that the rest of the participants did. This illustrates the plurality of women's experiences/motivations and that these results are not prescriptive of all women but just a piece of what may be missing for some women and possibly some men.

Other categories under the attainment value included the desire to interact with people and activities that involved a creative aspect. The asocial aspect of computing have been recognized by Margolis and Fisher among others, while the need to express oneself has been addressed by Forte and Guzdial [11].

4.2.1 Humanitarian Interest

Half of the participants, even those who were not in biomedical engineering, expressed interest in humanitarian goals, or goals that promoted human welfare. The participants were asked what qualities of a career were necessary in order for them to feel satisfied. One participant stated:

> "I guess I'd want a career that I felt like I was able to contribute to society somehow, that is important to me. Whether it be through directly helping people or creating something that may then be applied." –Nuclear Engineering student

Two other participants had a specific goal in mind in order to give back to society:

> "I really like helping people and as a career I want to be able to give something back to the world and [being] a doctor is a good way to do that. Like being useful to society. And I'm not just in it for the money like some people are. I want to like do.. I want to do pro bono work – like for free. I want to go and open up a free health clinic so that underprivileged children can have like dermatological care as well." –Biomedical Engineering

> "Well I'm not really sure what I want to do but right now I kind of, I'm looking to get like a diplomatic position in kind of a nongovernmental organization. Work with like human rights or women's rights, in other countries I guess." –Ivan Allen Liberal Arts International Affairs student

Interestingly, all three participants who were in biomedical engineering, cited a concern with human welfare as a reason for their career path.

4.2.2 Volunteering

Participants were asked about their volunteering experiences and most participants were currently or had been intensively involved in volunteering. The extent of some volunteering experiences were quite involved containing international experiences:

> "I mean we did all kinds of different things like playing with kids. Like one time we helped build an extra room in an orphanage in Mexico. And you know handing out like clothes and medicine and stuff" –Undecided Liberal Arts student

Some participants, even in their first semester, were still involved in volunteering activities:

> "I also sponsor a little girl in the Philippines, and so, her birthday is on the 30th, so I have to send her a gift" – Computational Media student

Other volunteering experiences were varied and involved:

> "Let's see, in high school I did a lot of different volunteer work. I did give kids the world, to help terminally ill kids. I did uh, I went down to Katrina and did hurricane relief, umm. I've done plant trees with Atlanta. Planting trees in Atlanta, stuff like that." – Biomedical Engineering student

We realize that volunteering may be a criteria for entrance to prestigious schools such as our University. However, some participants were still currently volunteering. The extent and depth of volunteering experiences seemed to go beyond filling the "requirement" for college applications.

4.2.3 Health

Health-related fields seem to "strike a young chord", as one participant said, among participants as five participants mentioned wanting to be a doctor at an early age. One participant actually entered our University as an architecture student but then decided to switch majors because she felt that she wasn't able to contribute enough to society.

> "Well, I wanted to be an architect because I was a stone mason in high school, so I built rock walls and gardens and things like that. And I had done a lot of working with blue prints and working with architects, so I was interested in it. But then, I heard about biomedical engineering and I thought there was a good way to help a lot of people at once." –Biomedical Engineering

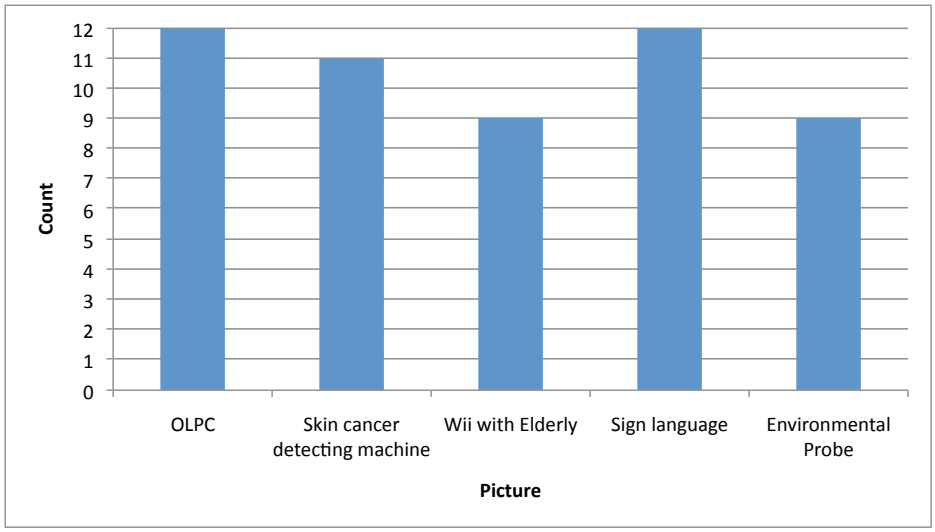

Figure 4: Which pictures are interesting

Another participant, although in nuclear engineering, cited medicine as the basis for her motivations:

> "I kind of see myself going in one of two paths. The first being sort of a researchers in medical physics or medical applications nuclear technology. And the other is, I'd like to be a plastic surgeon - go to med school, go through all of that and end up working for doctors without borders as a reconstructive surgeon." –Nuclear Engineering student

The health field seems to be an avenue for fulfilling the desire to help as four participants cited this theme.

4.2.4 *Conflicting Views of Computing*

The perception of computing conflicts with some of the participants' attainment values. This is particularly evident when computing as a career choice never even develops as a potential career option to fulfill those attainment values. This rift may cause participants to not conceive computing as a viable career direction.

> "As far as computing, I mean it helps run businesses so I guess so, it helps people but I mean I don't know if I see the direct correlation. I mean, I guess, abstractly I know it does." –Liberal Arts International Affairs student

> "Not really. I haven't really thought about it before. I mean you know like, I guess like indirectly they can help make websites for different organizations and then a lot of people visit the websites and donate money. If you kind of, you know what I mean. But that's not really a direct impact." –Undecided Liberal Arts student

Technology is viewed as not helping people. Some participants viewed people who worked in technology or computing as not having a concern with with human welfare:

> "It depends like my aspect of people working in technology – developing technology eventually helps people but I don't think they themselves are directly helping people."–Biomedical Engineering student

Participants who were in engineering disciplines were more likely to view the capability of technology to positively impact the world. However, the same enthusiasm did not necessarily translate over to perceptions of computing. Moreover, the biomedical participants felt that they were in a way already doing what some of the pictures depicted, such as helping to develop the skin cancer detecting device. They did not perceive a role or need for computing majors in such scenarios.

4.3 Responses to Photos

Participants were shown photos that depicted scenarios where technology was being used to address human welfare. Overall, participants found most of the photos interesting with the exception of two of the photos (see figure 4). One photo depicted seniors playing the Wii — participants did not view that scenario as important as the others.

Participants were asked what role they would like to play from a list of choices including variations of handing out and teaching the technology, designing the user interface and conducting user research, programming, and designing the hardware (see figure 5). Although handing out the technology/teaching and designing the user interface were clearly the most popular choices, programming was not completely out of the picture especially with the skin cancer detecting device. This raises a subtle point about the perception of programming in relation to the kinds of technologies presented. From this results, it seems that programming is not the main deterrent relating to computing. The fact that most participants would want to program an algorithm to detect skin cancer is striking.

In order to analyze the way the participants ranked the pictures, we assigned a point system to the place the participant choose it as. For example, we assigned 5 points to a

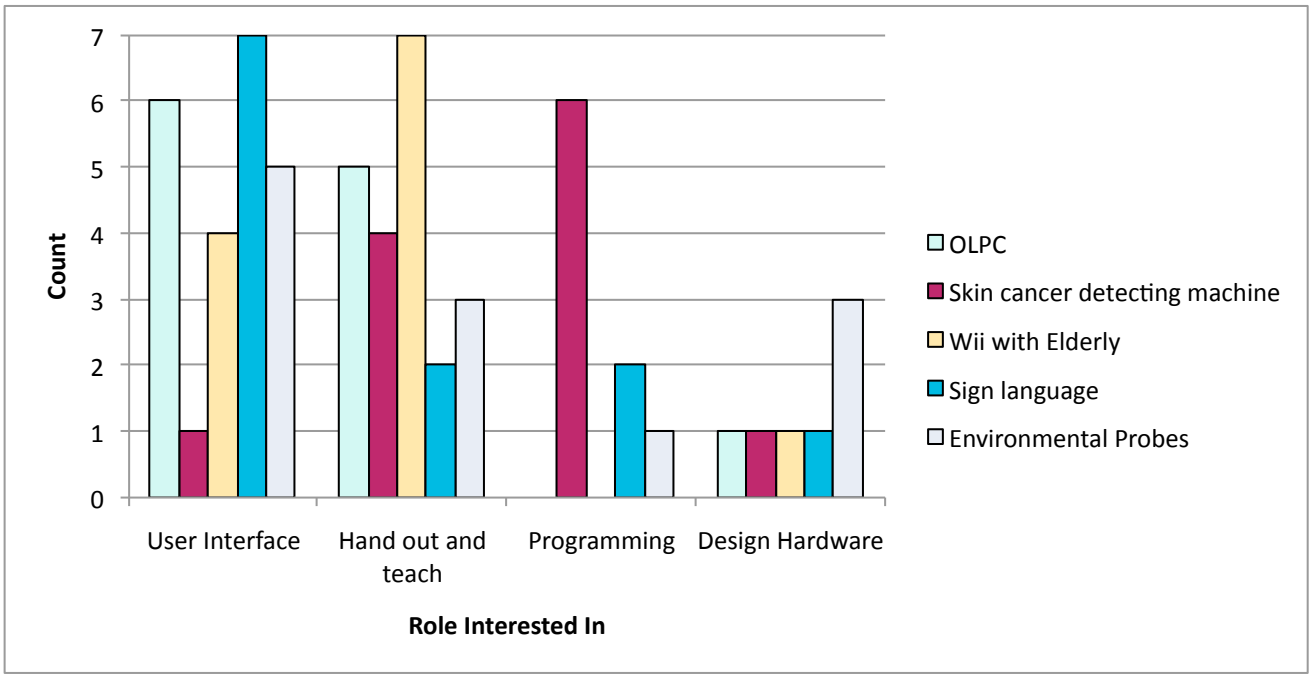

Figure 5: Role Interested In

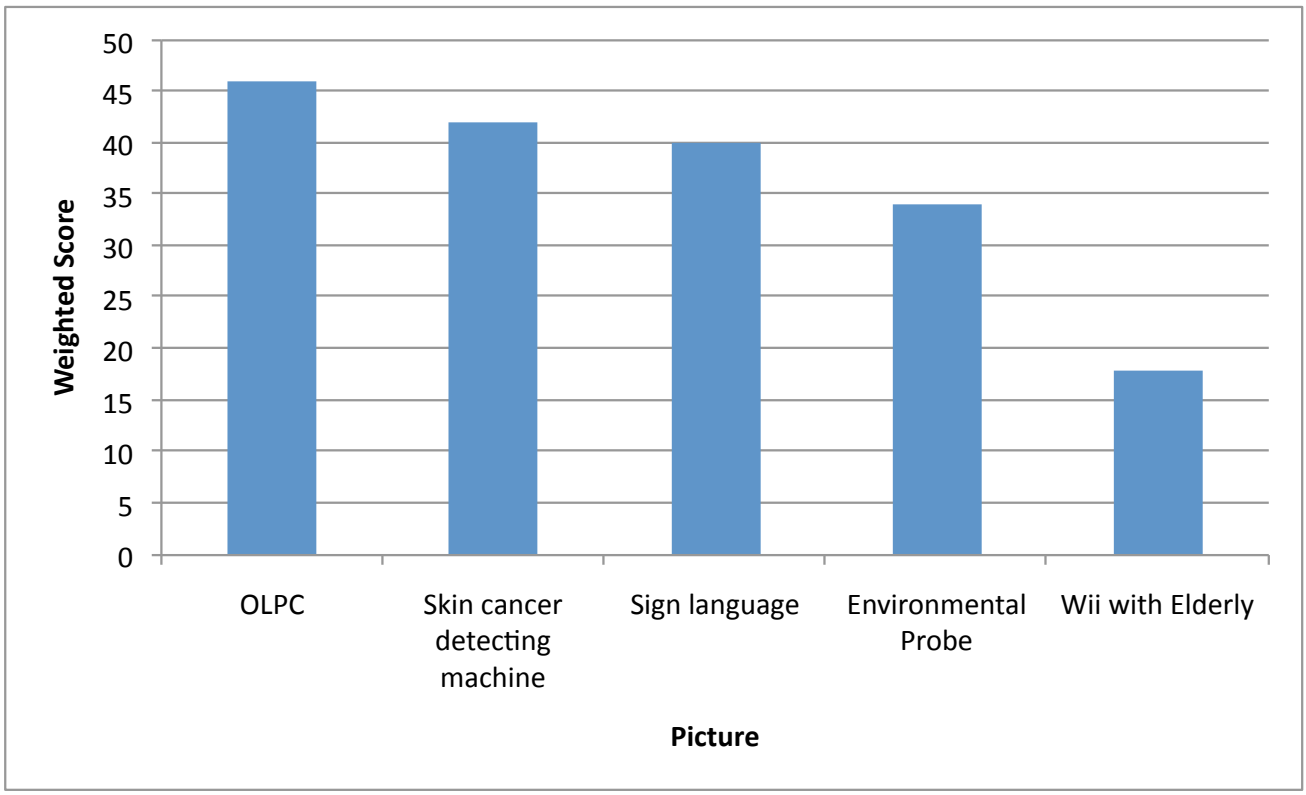

Figure 6: Order of Pictures

first place picture, 4 points to a second place picture, and so on to 1 point to a last place picture. Totaling the points for each picture, we found that the most popular picture was the OLPC picture (see figure 6).

5. DISCUSSION

We have seen evidence that some women are motivated by the desire to help, and this may also be true for men. However, some women may experience more of a paradox concerning their attainment value or identity in relation to computing. This aspect may cause some women to never even consider computing as a career option.

If women can be convinced that they are able to carry out their attainment values through computing, then the paradox could dissolve. In *Tech Saavy: Educating Girls in the New Computer Age* by AAUW, numerous interview of girls and teachers found a "can do, but don't want do" attitude towards computing [2]. This finding is a particularly illuminating example of computing being perceived as not having the ability to fulfill some women's attainment values.

Technology is not necessarily a neutral entity. In the process of creating, adopting, and teaching technology, certain values have been inscribed and reified through culture, academia, and industry. Winner describes how artifacts can embody social power. One example he gives is the presence of the extraordinarily low bridges over the parkways on Long Island; they were deliberately designed to discourage buses from traveling on the parkways to Long Island [26]. We can see evidence of the lack of neutrality in computing by asking ourselves, if technology is being used to help people, then why aren't more women pursuing computing?

Collet posits that when adolescent males took over computing in the early 1980s, with the introduction of the personal PC, they redefined computing. "They became the predominant, if not the exclusive, users of the family computer. Adolescent male technophiles, at just the age when they need to define themselves in opposition to females, formed clubs and groups dedicated to programming and video games. When they went to university, they encountered a curriculum and an institution that reinforced the process" [7]. Computing became, as described by Margolis and Fischer, as a 'counter narrative' to women [15].

Currently a national effort is being made to change the public image of computing by leaders from ACM, CRA, IEEE-CS, USENIX, SIAM, AAAI, NCWIT, and from Microsoft, Intel and HP headed by Jill Ross[18]. This image campaign task force includes changing the perception that computing can be used for the greater good or to help people and society.

5.1 Implications for Computing Curriculum

There has been a trend toward service learning in the context of computing curriculum in hopes of attracting and retaining more students in computer science. Examples of this include the Humanitarian FOSS project, and projects of San Francisco University, Georgia Institute of Technology, and Southwest Missouri State (now Missouri State University) [10, 5, 20]. These projects are testing the hypothesis that service learning can help revitalize undergraduate computing education.

Congruent with our findings service learning could help to attract and retain more women. However it is important that students are exposed to this context in introductory computing courses. If service learning opportunities are only offered in advanced courses or as independent research opportunities, students who take introductory level courses may never be exposed to computing as a way to fulfill their attainment values or identity. Students may not be capable of completing full computer science projects that help society at the introductory level. They still must acquire the basic computing skills necessary to reach that point. There is nothing inherently wrong with current introductory programming courses, unless if they exist in a vacuum without any context.

Students must believe that they are on a trajectory towards helping or legitimately peripherally participating in a "culture of practice" as described by Lave and Wenger [14]. For example, the Nuclear Engineering student was not currently helping people given her current studies, but she was on a trajectory to medical school, which would lead her to be a doctor, and finally allow her to help people. In her mind, she was legitimately peripherally participating by being a Nuclear Engineering student because she had heard that she had good chances of getting into medical school given her unique and challenging major. Students must believe that they are on a trajectory towards meeting their values with computing.

Also, simply having courses that allow students to fulfill their attainment values is not enough to reach gender parity. As shown by Gavin-Doxas and Barker, classroom environments that are defensive are demonstrative of many communication and interaction behaviors [12]. An example of a defensive communication style is an individual who portrays superiority which tends to give others a lack of worth and/or are in some way inadequate. It is still imperative that the environment is not discriminating and provides support for women.

6. CONCLUSION

One reason why some women may not pursue computing is that they never perceive technology or computing to help people or society. Some women are caught in a paradox: in order for women to currently succeed in computing they have to place a value on more masculine views or ignore their sexual difference, which may discourage some women from considering the field. Changing the image of computing is then imperative. However, another direction to explore is where is the image coming from? Is it true that the remnants of the original "nerds" who took over the computer in the 1980s continue to perpetuate the image?

Joan Wallach Scott states in her book that "historically modern Western feminism is constituted by the discursive practices of democratic politics that have equated individuality with masculinity" [22, p. 5]. The hurdle is then letting women be accepted as individuals in their own right and having more than paradoxes to offer.

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