

This Is Who I Want to Be!

Exploring Possible Selves by Interviewing Women in Science

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Adolescent girls learn about women in science to access, imagine, and plan possibilities for future career pathways in the sciences and to practice writing as a transferable skill with meaningful purpose.

Today I remembered science still interests me. Today I remembered we can do whatever we put our mind to. (Clara, ninth-grade student; all names of student and teacher participants are pseudonyms)

Standing at the front of the classroom, I hold *The Watcher: Jane Goodall's Life With the Chimps* by Jeanette Winter (2011), a children's book about the famous anthropologist and animal rights activist. I introduce the book by describing a memory of my mom taking me to hear Goodall speak at a local theater in Eugene, Oregon, when I was 9 years old. I share how attending this talk deeply inspired me:

After I heard Jane Goodall and saw images of the apes she worked with in Africa, I remember thinking, "I want to do research when I grow up. I want to be engaged and helpful in the world in some way like Jane Goodall."

Fifteen adolescent girls sit in their desks in front of me as I go on to read aloud about this famous woman scientist. The room falls silent. The story describes Goodall as a young girl. She is full of curiosity. She falls in love with animals, beginning with her own backyard chickens. As an adult, Goodall devotes her life to researching apes in Africa. As an anthropologist and activist, she advocates for the protection and preservation of animals through science. As I finish reading, I ask the group of adolescent girls if they have ever heard of Goodall before listening to this story. No one responds. Then, Marissa, a ninth-grade student, shoots her hand up and blurts out, "I never knew there were people who studied monkeys for a job! How do I do that?"

This article shares a study of an interview-writing component of a Girls Writing Science Project, which took place at an ethnically and linguistically diverse urban high school in a major urban center in the Southwestern United States. The project was funded by a grant from the National Writing Project and National Science Foundation to support the examination of the intersections between writing and science in formal and informal classroom settings. In this classroom-based writing project, a group of girls in grades 9–11 met once a week for seven weeks to use writing to examine the role of women in the sciences.

This study represents a model for teachers across disciplines to use the teaching of writing for students to access, explore, and articulate possibilities for their future selves in connection to science. More specifically, this project offers a means for teachers of writing to support their students in studying high-achieving women working in science-related careers as a step toward narrowing the gender divide in the sciences and to practice writing as a real-world, transferable skill with meaningful purpose (Bystydzienski & Bird, 2006; Early & DeCosta, 2012). Within the Girls Writing Science Project, students participated in a writing unit to plan, initiate, and conduct an interview of a woman scientist working in a field of interest to each of the girls. As a culminating project, the girls each wrote a profile of

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a woman scientist to share what they learned and how they were impacted by this work. Through communication with and writing about women mentors, this literacy community had an opportunity to imagine future pathways in relation to science.

Girls and Science

There is great educational and societal need to support ethnically and linguistically diverse girls as they envision, prepare for, and access their future lives. Women do not enter science fields at the same rate as men for a variety of reasons, including not seeing these pathways as available to them, less accessibility to female science mentors, not knowing that these pathways exist, and a perpetuated myth that girls do not care about science, technology, engineering, and mathematics (Miller, Blessing, & Schwartz, 2006; Scott & White, 2013; Siann & Callaghan, 2001). In recent years, there has been a dramatic increase in the number of women in college. For example, women now outnumber men in undergraduate and graduate programs, and more women are entering science fields than ever before (Burke & Mattis, 2007). However, men still far outnumber women in engineering, computer sciences, and physics. Similar gender preferences across the disciplines of science, technology, engineering, and math exist for graduate degrees, as women earned only 31% of physical science, 26% of mathematics/computer sciences, and 23% of engineering doctorates (National Science Board, 2010). Moreover, ethnically diverse women continue to be underrepresented and underutilized in science fields due to systematic racism and sexism (Ong, Wright, Espinosa, & Orfield, 2011).

A growing body of research and programs has emerged attempting to describe girls' perceptions of career pathways and connect them more directly toward choosing science-related careers. Changing teachers' practices around areas such as standards-based teaching, hands-on learning (Harwell, 2000), and performance-based assessment (Freedman, 2002) has the potential to increase students' attitudes and engagement, specifically for girls toward science (Parker & Rennie, 2002). Even with these advancements in research and teaching, girls still have limited opportunities to learn science as compared with boys, and ethnically and linguistically diverse girls are less likely to pursue and enter science-related careers than their white peers (Mullen & Baker, 2015; Scantlebury & Baker, 2007). This article demonstrates how teachers may use real-world writing instruction and curriculum (Early, DeCosta-Smith, & Valdespino, 2010) as a means of creat-

ing more equitable learning communities for ethnically and linguistically diverse adolescent girls to imagine, investigate, and articulate their future selves in relation to science (Lee, Husman, Scott, & Eggum-Wilkens, 2015).

Possible Selves and Sociocultural Theory

In this study, I apply two intersecting theories: sociocultural theory (Prior, 2006) and the theory of possible selves (Oyserman, Terry, & Bybee, 2002). I draw from sociocultural learning theory, in which the specific cultural activities of language learning and writing are products of social interaction and embedded in a larger cultural and institutional context (Vygotsky, 1978). From this perspective, the everyday worlds, social interactions, and relationships in which students participate and engage are rich and valued sites of learning. A sociocultural lens also allows for an examination of adolescent girls engaged in a new kind of learning within the writing classroom, which is the social practice of forming and participating in a writing community as a means of imagining their future selves in connection to science.

Along with sociocultural learning theory, I draw from Oyserman et al.'s (2002) concept of possible selves, defined as "the future-oriented component of self-concept" (p. 313). Envisioning possible selves is the act of examining interests, goal setting, and situating self in the future in newly imagined ways with guidance and support. "Youth construct *possible selves* by synthesizing what they know about their traits and abilities and what they know of the skills needed to become various future selves (Cantor et al., 1987; Anderson, 1991; Crane, 1991; Curry et al., 1994)" (pp. 313–314). This study examines a secondary writing community that worked to tap into this notion of possible selves by helping adolescent girls envision and think about their future identities, pathways, and interests in connection to science. I use the concept of possible selves as an inspiration for what I call a future lives writing curriculum, one that opens future possibilities for students to engage in planning for and envisioning their future lives or selves through writing (Singer & Hubbard, 2003).

Much has been written about the need for teachers, researchers, and schools to create writing opportunities for students to build bridges between classrooms and the worlds that they will one day enter through higher education, the workplace, and the community (Gallagher, 2011; Purcell-Gates, Duke, & Martineau, 2007). There is also a growing body of research examining the benefit of exposing ethnically and linguistically

diverse girls to hands-on and interactive science learning (Freedman, 2002). This project fills a gap in current research by offering a concrete and replicable model of how researchers and teachers may work toward increased equity and access in education by offering real-world writing opportunities for secondary students to explore their future selves in connection to science. My guiding research question for this inquiry was, In what ways does the interview-writing component of the Girls Writing Science Project curriculum allow students to use writing as a means of imagining their future selves in connection to science?

Methods

School Setting

This study took place at Metro Center Academy, a tuition-free, public K–12 charter school located in the heart of a major metropolitan city. A local university in partnership with the city’s high school district sponsors the school’s charter. The student body comprises 1,100 students. The school is 68% Hispanic, 15% white, 13% African American, 2% Native American, 1% Asian, and 1% two races. Metro Center Academy receives Title I funds, with over 74% of the student body qualifying for free or reduced-price lunch. Sixty-nine percent of the students come from homes where Spanish or another second language is spoken.

Through professional development, teacher training, and National Writing Project programs, I have formed a bidirectional relationship with Metro Center Academy and, more specifically, its English department. This connection allowed for the recruitment of one English language arts (ELA) teacher and one science teacher to collaborate on implementing the Girls Writing Science Project. Using language arts and science teacher recommendations and an open invitation letter to parents, we initially recruited 22 girls in grades 9–11. The teacher recommendation process helped in recruiting girls whom the teachers thought would benefit most from a future lives curriculum, and the letter sent home to parents helped ensure family and student interest and investment. There were no specific GPA or grade requirements to participate.

Participants

Students. Out of the 22 girls who began, 15 completed this project. Participation was voluntary. Some students chose not to continue after the first few days,

others were drawn away for assessments and testing, and still others were absent due to illness. Of the 15 final participants, 12 identified as Hispanic/Latina, two as white, and one as Filipina. Thirteen of the 15 girls spoke a second language, and seven reported speaking Spanish only at home. All of the students planned to attend college, and 13 were first-generation college bound. The girls reported GPAs ranging from 2.38 to 4.25, and the group exhibited a range of academic strengths. The participants were all released from their normally scheduled Capstone course, a combination of study hall, school spirit activities, and character education, to attend this classroom-based workshop once a week for seven weeks for one to two hours per session.

Classroom Teachers. Two classroom teachers—an ELA teacher and a high school science teacher—were generous in allowing access to their students and curriculum. Each teacher chose to support the project through observational and organizational roles. Prior to the workshop, the ELA teacher assisted in communicating and establishing the workshop schedule. The teachers also helped recruit and communicate with students, other teachers, and the administration. The two teachers copied and stored materials, set up technology, and occasionally worked with students in small groups.

Researchers. I collaborated on the design and implementation of the overall Girls Writing Science Project with my colleague, Christina Saïdy. We are English education professors and the director and codirector of a local site of the National Writing Project at our university. I am a white, middle class woman with a PhD, and I taught high school ELA and college composition prior to becoming a professor. Christina is a white, middle class woman with a PhD, and she taught middle school and high school language arts and college composition prior to becoming a professor. As research partners, we collaborated to create the overall curricular map for the project, gain access to the school, receive research permissions, and collect data. Within the project, we divided components of the curricular design and instruction based on our individual research interests and unique expertise. We chose to write from the data individually, as I do in this article, to pursue our individual research questions from our unique lenses.

Instructional Overview

Each meeting of the Girls Writing Science Project involved explicit teaching, modeling, and practicing of writing to link the girls to women in science careers.

The overall curriculum involved four major facets (see Figure 1). One was a gallery walk of women in science and nonfiction texts, such as autobiographies, biographies, memoirs, children's books, recorded interviews, and TED talks by women scientists. The second and third parts, the focus of this article, included preparing for an interview with a woman scientist and involved goal setting, a first-thoughts letter, interview protocols, and writing professional e-mails. In the third part, students identified, e-mailed, interviewed, and wrote up their

Figure 1
Girls Writing Science Project Curriculum Calendar

Week	Focus
1	Welcome: 1. Workshop overview 2. Write what a scientist looks like and does 3. TED talk and reflection
2	Possible selves and interviews: 1. Opening woman in science children's book 2. TED talk and reflection 3. Introduction to interview assignment 4. First-thoughts letter
3	Overcoming barriers, and turning points for women 1. Gallery walk of women in science 2. What do I want to know about science? Who might I want to interview? 3. Interview protocol
4	Interview protocols 1. Woman in science children's book 2. Writing interview questions 3. Interview question peer workshop 4. Writing professional e-mails
5	Interview protocol 2 1. Woman in science children's book 2. Refine interview questions and send e-mails/ make calls 3. Writing from our interviews 4. How can I see myself in this interview? Possible selves (2 hours) 1. Woman in science children's book 2. Writing your lead and integrating quotes 3. Making connections with women in science 4. Sharing drafts and revising
6	Conclusion 1. Workshop review 2. Share your interview profile 3. Written reflection 4. Closing celebration

findings. The final component included an opportunity for students to envision their future selves. For this, students drew a visual image of how they imagined a scientist pre- and postworkshop and then wrote a reflection on their interview experience and how it impacted their vision of their future selves. The focus of this article is the interview-writing component of this workshop, so the reader may gain insight into this aspect of the curriculum and the instructional choices, student voices, writing samples, and broader outcomes and directions for this kind of work.

Data Collection and Analysis

Data analysis began through the process of data collection with the decisions that I made as a participant observer (Spradley, 1980), throughout my collection of writing samples and surveys, and in my written observations and reflections. To understand and interpret the stories, experiences, and perspectives revealed in the data and to align with my sociocultural approach, I applied a multidimensional and situated approach to understanding the textual data (Kamberelis & de la Luna, 2004). Categorization of the data was a fluid process. I merged or shifted categories as needed as the analysis advanced (Charmaz, 2006; Glaser & Strauss, 1967).

In the initial stage of analysis, I separated and gathered textual data produced by individual writers, and highlighted and noted recurring ideas, threads, or questions that emerged from individuals' written texts. This allowed me to see the body of work produced by each individual over the progression of the project. In the second stage of analysis, I reorganized the data based on types of text produced and in dated order of production. This organized data into writing events and allowed for an examination of texts as events as a collective within the literacy community and not as solo or decontextualized acts. In this read-through, I made a list of overall codes to see what began to emerge across writing tasks in terms of content and theme (see Marshall & Rossman, 1999). Some of these codes were imagining, clarifying, questioning, identity, inspiration, family, hobbies, teachers, wonder, and reaching out or gaining access. Next, I collapsed codes into more general themes, which resulted in a set of three broader codes: envisioning future selves, writing toward possible selves, and reflecting on future selves. Within my findings, I detail curricular choices and writing outcomes to create a vivid portrait of this school-based, real-world writing community in action.

Envisioning Future Selves

In the first weeks of the project, students used writing to work through the process of envisioning their future selves in relation to science. For example, during the first meeting, I asked students to write their goals for participating in the writing community. Students' reasons for participating revealed how some of them came to the project because they already envisioned their future lives in connection to science based on lived experiences and relationships. Amelia wrote, "I want to interview an oncologist because I want to become a pediatric oncologist in the future. I have always found cancer so interesting. I have had cancer in my family." Another student, Clara, described her interest in interviewing a botanist. She wanted to attain specific things from her interview in terms of accessing information and gaining a better understanding of this career path: "I want to be a botanist in the future, so this interview can help me with my future job. Also, the woman I interview can help me understand what is required for a degree in botany."

There were other students who had never envisioned their future lives in connection to science prior to this project. For these students, initial participation in this group and imagining their future pathways or interests in relation to science were part of a social process of connecting to teachers or with friends, more than a derivative of their own interests or future goals. For example, a couple girls expressed a strong interest in makeup and cosmetology because this is something that they enjoy doing with their friends, so they tried, in their goal-setting writing, to connect this to science. Rosario wrote, "I would like to interview a scientist who does chemicals in make up or who does make up. I would like to interview her because it seems interesting and I feel like this person will be connected to me." The initial writing, for students like Rosario, revealed how envisioning their future selves in connection to science was new and challenging.

The writing also revealed how these students needed help in honing a science-related interest/career path and narrowing overly broad visions. For example, Zyria wrote in an early reflection, "I'm fascinated in chemistry, physics, engineering, and sustainability." Students' writing also revealed a need for support to understand and define what counts as science and what it means to work in science. The writing curriculum design and instruction represented a continual process of checking in with and responding to students' needs, interests, and perspectives, and it also served as an avenue for students to begin to articulate their interests in ways

that they had not done before. Students began to think about, name, and examine their interests and future goals in relation to science.

Writing Toward Possible Selves: Making Connections

Through the project, we wanted students to see the social nature of learning within and beyond our community of writers. We used interview writing as a mechanism through which the girls could work toward socially constructing or envisioning their possible selves in science based on their own interests, goals, connections, writing, and thinking. The middle weeks of this project included a series of writing events and invitations for students to use writing to make professional and unfamiliar connections and to build networks beyond the classroom walls. In terms of accessing women in science, students had the option of drawing from their own social networks. Two girls chose to interview a favorite science teacher at Metro Center Academy, and another interviewed her cousin, a psychologist.

If students did not know women scientists to interview, we paired girls with women scientists doing work connected to the girls' interests. We set out to find women in science by e-mailing professors whom we knew through work, reaching out to mothers of our children's friends, and cold-calling public and private community businesses. The women who agreed to be interviewed were thrilled to be of help and expressed enthusiasm and interest in the project. For example, when I reached out to a pediatrician by e-mail, she responded, "I would love to participate! This is such a cool project!" (see Table 1).

We encouraged students to craft interview protocols to assist in finding out what they wanted to know from their interviewee and in moving their own thinking forward about their future selves in relation to science. For example, Sara was interested in becoming a technician in a science lab but did not know how to move toward this dream. She used the interview as an opportunity to ask questions about the logistics of this work (e.g., "What do you do working in a lab?"; "What does it mean to be a tech?") and to help her make a decision about moving forward with this career choice (e.g., "What age did you figure out you wanted to be a lab technician?"; "Did you ever want to do something else when you were young?"). Sara wanted help in judging her own levels of certainty about this career path.

The act of communicating with and receiving a personal and authentic response from professional women

Table 1
Girls Writing Science Project: Women in Science Pairings

Interviewee's type of science work	Student interest
Remediation manager: State Department of Environmental Quality	Environmental work, sustainability
Zookeeper: City Zoo	Animal sciences
Nurse midwife	Nursing, healthcare
Pediatrician	Doctor, healthcare
Archaeologist	Chemistry, archaeology, forensics
Forensic scientist: Phoenix Police Crime Lab	Forensics
Veterinarian	Animals
Pediatrician	Kids
Human evolutionary biology	Anthropology
Paramedic	Community medicine
Human evolutionary biology	Anthropology
High school science teacher	Biology and education, insects
Nutrition	Health, nutrition
Psychologist	Mental health

represented a turning point in the project. Conducting and writing up an interview allowed students to experience writing as a social process grounded in lived experiences with real and applicable purposes. For example, students were delighted and surprised when they received interview responses from their paired women in science. Leah walked into the classroom after receiving her interview response the night before via e-mail and exclaimed, "I can't believe my scientist actually wrote back to me!" Leah was also delighted that her scientist had sent photos along with her interview responses: "It was so cool to see the midwife's face and a photo she had taken at a birth!" The engagement with the women scientists from the community made this project more than an assignment and, instead, something that students were deeply invested in, responsible for, and connected to. Students held agency throughout this process: the selection of the kind of scientist they wanted to interview, writing interview

questions, and initiating, conducting, and writing up the interviews.

The interview process also gave students some understanding of the everyday aspects of the work of scientists and of the pathways to entering and succeeding in specific science fields. Anita wrote, "The most surprising thing I learned from my scientist is sometimes she is so busy she doesn't eat lunch because she needs to get all of her patients. Also, she had eleven years of training!" Leah interviewed a midwife and was surprised to learn that this is not a high-paying job. Coco learned through her interview that her scientist's research is funded through grants. Other students realized that they could improve in the communicative and writing process of interviewing. Mariah wrote, "I wish I had asked more specific questions about her career and process of her work." Coco wrote a list of questions that she wished she had asked her interviewee but had not thought of until afterward: "How does she manage her time? What is her main focus in work? What benefits does she receive?" We invited students to e-mail their scientists if they still had pressing questions.

At the core of this curriculum was the social nature of writing. Students chose topics based on their interests, friendships, hobbies, and/or relationships. They reached out to people to interview and to learn from. In addition, they had an audience to write for and share with. Beyond these standard socially mediated mechanisms, students engaged in a new kind of writing and learning, in which they were asked to engage with and reflect on other people's life experiences and professional choices as a means of thinking about and planning their own. The women scientists served as examples of possible life pathways that students could envision, examine, and articulate in relation to their own dreams and interests through writing.

Reflections on Future Selves

In the final writing events for this project, students wrote their findings as an interview profile (see Figure 2). The profiles gave students an opportunity to tell the story of the individual woman they had interviewed and to include their own lessons learned and perspectives based on the interviews (see Figure 3). For the profile contents, we asked students to introduce the woman they had interviewed, share her significant life and career pathways, and share what they had learned through the experience as young women and interviewers. This writing, although focused mainly on the story of a woman in science, became a way for the girls to reflect on their own lives, interests, and perspectives in

Figure 2
Girls Writing Science Project: Interview Profile Assignment

We would like you to write a profile essay based on your interview with a woman scientist. This interview write-up will not only teach others about this particular scientist but also share what this work has to offer others, what you have learned, or how you have grown through this process. You will share this piece with your classmates, teachers, and other young women whom you hope to inspire.

The write-up must include the following:

- A title
- A successful lead
- Background information about the woman scientist written in an interesting way
- At least one interesting anecdote (story) about the scientist
- At least two quotes from your scientist
- A connection to your own life
- A successful conclusion: what you learned about yourself and who you want to be through this interview process

Figure 3
Girls Writing Science Project: Student Interview Profile

Everything is There for a Reason

Isabel Querra faced many problems in her path to becoming a psychologist. Among these problems were being away from her family and facing the fear of being alone. The school she attended was far from the place she lived and she had financial problems, such as paying for her education, housing, and personal needs. Although she faced these obstacles, nothing snatched her passion for helping others.

Isabel is a psychologist. She is interested in other people's behavior and why they act the ways they do. Her interests moved on to helping people to overcome their problems and grow even better as people. She wants to help people learn to be happy with themselves. She says, "It gives me a great feeling seeing people better than how they were the first time." Psychologists are people who listen to you. They help you overcome your problems and face difficult situations.

Like most people, Isabel has second-guessed her career. "If I had the opportunity to change my career, I would choose medicine," she said. Her biggest fear as a psychologist is not being able to help one of her patients. Her goal is to help people face their problems and change their attitudes about obstacles they face.

From this interview experience, I take away the feeling that helping others is the best thing to do always. You never know if you are the only person helping someone else. In the end, you might help them to feel happier or to live better with themselves. This is one of my future goals. I was once there for someone who was contemplating suicide. This was the first time I realized that helping people is what I want to do. The person I helped had a lot of problems but she told me I helped by being there for her. This interview made me grow as a person and my passion for my future career as a psychologist increased.

relation to science. It also served as a way they could begin to articulate and imagine their future lives in connection to science through writing. For example, Clara wrote, "The interviewee seemed really adventurous. I'm adventurous!...We both want to help people." Alicia loved that the woman she interviewed had experienced a similar kind of support from a high school chemistry teacher. The community of writers shared their final profile essays aloud with their peers on the last day of our workshop and also sent their write-ups to the women they had interviewed as a culminating written exchange.

As part of their interview profile essays, students reflected on the interview experience and on the work-

shop as a whole. They emphasized how this writing project represented a new kind of learning, requiring them to reach beyond the classroom and out into the community to understand the intricate choices, pathways, and actions that women take to become successful scientists. In her concluding paragraph of her interview profile, Leah wrote, "I found out you learn every day in a science career." Brittney shared how she appreciated learning specific writing skills:

I will take away knowledge and skills from this interview. By extending their learning networks beyond the classrooms and taking part in the interview process, students articulated how they learned how to rely on themselves in ways they had not before. Some of the skills are learning

new forms of writing and being more open minded with my thinking and writing.

Josephine's biggest takeaway from the project was the importance of setting her mind to something and working toward it:

What I took out of this interview project was that you need your heart to be set on your goal to accomplish it. Hard work pays off in the end. After you learn what is expected to accomplish a goal, then you need to set yourself up to accomplish it.

For many of the students, the interview process expanded what they had thought was possible for them as young women. Coco wrote,

I never really put to mind that women can balance a job like Julie's and take care of a family. I appreciate women like her and all they do. After weeks of constantly coming to the workshop, I got to see more of why I enjoy science. I understand what I have to do to get where I want to be and make a mark for myself. I got to see women do things I didn't even know were possible. My inner feminist came to the surface and I saw women can be as smart and as equal to men.

Concluding Thoughts

This study serves as an example of how writing researchers and teachers may examine the teaching and learning of writing as acts deeply grounded in the sociocultural activities, curricular invitations, and available sponsors within and beyond school settings (Brandt, 2001; Early, 2010; Prior, 2006). Moreover, the structure and content of this unit created the conditions for the social construction of a new kind of learning that students used to write in envisioning their possible selves in science (Oyserman et al., 2002). This project also serves as a poignant model for researchers and educators committed to working toward equity and inclusion in education, shrinking the gender divide in the sciences, and providing more equitable opportunities for adolescent girls across grade levels and disciplines.

This project serves as an example of how the research and teaching of writing may offer new learning pathways for adolescent girls to connect to the larger world beyond their lived experiences and in relation to others as a way to think about how they want to act, live, and work in the world. This study also suggests potential opportunities for longitudinal research beginning with real-world writing experiences within school settings to document its impact and influence

TAKE ACTION!

Tips for starting a Girls Writing Science Project:

1. *Find an opening in the school day:* Find a time in the school schedule to create a Girls Writing Science Project learning community.
2. *Create partnerships:* Partner with a science or ELA teacher to cocreate an interview-writing project. Reach out to your local National Writing Project site for support and resources.
3. *Collect resources:* Build a collection of children's books, autobiographies and biographies, TED talks, and articles about women in science.
4. *Connect to women in science:* Reach out to these women in your local community.
5. *Gather interview materials:* Find examples of interviews of women in science to use as models for students as they conduct their own (e.g., Fresh Air on <http://www.npr.org/>).
6. *Extensions:*
 - Create a culminating event for the women scientists to meet the students.
 - Publish students' interview profiles on a digital space or in a bound collection.
 - Take the girls to a local science center or science museum.

on women in college, the workplace, and the community. This curricular model has the potential to cut across disciplines, beyond science, and for various purposes. There are many obstacles to overcome if we are to raise the number of women involved in scientific careers and pathways. This project suggests that part of the solution occurs in the teaching of writing at the secondary level, so students have opportunities to access, engage with, and write for real audiences as a way to envision possibilities for their future selves in connection to science.

NOTES

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REFERENCES

Brandt, D. (2001). *Literacy in American lives*. Cambridge, UK: Cambridge University Press.

- Burke, R.J., & Mattis, M.C. (2007). *Women and minorities in science, technology, engineering, and mathematics: Upping the numbers*. Northampton, MA: Edward Elgar.
- Bystydziński, J.M., & Bird, S.R. (Eds.). (2006). *Removing barriers: Women in academic science, technology, engineering, and mathematics*. Bloomington: Indiana University Press.
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative research*. London, UK: Sage.
- Early, J.S. (2010). "Mi'ja, you should be a writer": Latino parental support of their first-generation children. *Bilingual Research Journal*, 33(3), 277–291. doi:10.1080/15235882.2010.529348
- Early, J.S., & DeCosta, M. (2012). *Real world writing for secondary students: Teaching the college admission essay and other gate-openers for higher education*. New York, NY: Teachers College Press.
- Early, J.S., DeCosta-Smith, M., & Valdespino, A. (2010). Write your ticket to college: A genre-based college admission essay workshop for ethnically diverse, underserved students. *Journal of Adolescent & Adult Literacy*, 54(3), 209–219. doi:10.1598/JAAL.54.3.6
- Freedman, M.P. (2002). The influence of laboratory instruction on science achievement and attitude toward science across gender differences. *Journal of Women and Minorities in Science and Engineering*, 8(2), 191–200. doi:10.1615/JWomenMinorScienEng.v8.i2.50
- Gallagher, K. (2011). *Write like this: Teaching real-world writing through modeling and mentor texts*. Portsmouth, NH: Heinemann.
- Glaser, B.G., & Strauss, A.L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. London, UK: Wiedenfeld and Nicolson.
- Harwell, S. (2000). In their own voices. Middle level girls' perceptions of teaching and learning science. *Journal of Science Teacher Education*, 11(3), 221–242. doi:10.1023/A:1009456724950
- Kamberelis, G., & de la Luna, L. (2004). Children's writing: How textual forms, contextual forces, and textual politics co-emerge. In C. Bazerman & P. Prior (Eds.), *What writing does and how it does it: An introduction to analyzing texts and textual practices* (pp. 239–277). Mahwah, NJ: Erlbaum.
- Lee, J., Husman, J., Scott, K.A., & Eggum-Wilkens, N.D. (2015). COMPUGIRLS: Stepping stone to future computer-based technology pathways. *Journal of Educational Computing Research*, 52(2), 199–223. doi:10.1177/0735633115571304
- Marshall, C., & Rossman, G.B. (1999). *Designing qualitative research* (3rd ed.). Thousand Oaks, CA: Sage.
- Miller, P.H., Blessing, J.S., & Schwartz, S. (2006). Gender differences in high school students' views about science. *International Journal of Science Education*, 28(4), 363–381. doi:10.1080/09500690500277664
- Mullen, A.L., & Baker, J. (2015). Participation without parity in U.S. higher education: Gender, fields of study, and institutional selectivity. *NASPA Journal About Women in Higher Education*, 8(2), 172–188. doi:10.1080/19407882.2015.1057167
- National Science Board. (2010). Higher education in science and engineering. In *Science and engineering indicators 2010* (pp. 2-1-2-48). Arlington, VA: National Science Foundation.
- Ong, M., Wright, C., Espinosa, L., & Orfield, G. (2011). Inside the double bind: A synthesis of empirical research on undergraduate and graduate women of color in science, technology, engineering, and mathematics. *Harvard Educational Review*, 81(2), 172–209. doi:10.17763/haer.81.2.t022245n7x4752v2
- Oyserman, D., Terry, K., & Bybee, D. (2002). A possible selves intervention to enhance school involvement. *Journal of Adolescence*, 25(3), 313–326. doi:10.1006/jado.2002.0474
- Parker, L., & Rennie, L. (2002). Teachers' implementation of gender-inclusive instructional strategies in single-sex and mixed-sex science classrooms. *International Journal of Science Education*, 24(9), 881–897. doi:10.1080/09500690110078860
- Prior, P. (2006). A sociocultural theory of writing. In C. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *The handbook of writing research* (pp. 54–66). New York, NY: Guilford.
- Purcell-Gates, V., Duke, N.K., & Martineau, J.A. (2007). Learning to read and write genre-specific text: Roles of authentic experience and explicit teaching. *Reading Research Quarterly*, 42(1), 8–45. doi:10.1598/RRQ.42.1.1
- Scantlebury, K., & Baker, D. (2007). Gender issues in science education research: Remembering where the difference lies. In S. Abell & N. Lederman (Eds.), *Handbook of research on science education* (pp. 257–286). Mahwah, NJ: Erlbaum.
- Scott, K.A., & White, M.A. (2013). COMPUGIRLS' standpoint culturally responsive computing and its effect on girls of color. *Urban Education*, 48(5), 657–681.
- Siann, G., & Callaghan, M. (2001). Choices and barriers: Factors influencing women's choice of higher education in science, engineering and technology. *Journal of Further and Higher Education*, 25(1), 85–95. doi:10.1080/03098770020030524
- Singer, J., & Hubbard, R. (2003). Teaching from the heart: Guiding adolescent writers to literate lives. *Journal of Adolescent & Adult Literacy*, 46(4), 326–338.
- Spradley, J.P. (1980). *Participant observation*. New York, NY: Holt, Rinehart and Winston.
- Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes* (M. Cole, V. John-Steiner, S. Scribner, & E. Souberman, Eds. & Trans.). Cambridge, MA: Harvard University Press.

LITERATURE CITED

- Winter, J. (2011). *The watcher: Jane Goodall's life with the chimps*. New York, NY: Random House.

MORE TO EXPLORE

- Baker, T., & Carroll, B. (2016). Working at the intersections of formal and informal science and literacy education. *Connected Science Learning*. Retrieved from http://www.nwp.org/cs/public/download/nwp_file/21300/CSL_Working_at_the_Intersections.pdf?x-r=pcfile_d
- Blog Talk Radio. (2016, June 23). *Intersections: Powering science learning through partnerships*. New York, NY: National Writing Project. Retrieved from http://www.blogtalkradio.com/nwp_radio/2016/06/23/intersections-powering-science-learning-through-partnerships
- Elliott, L.A., Jaxon, K., & Salter, I. (2017). *Composing science: A facilitator's guide to writing in the science classroom*. New York, NY: Teachers College Press; Berkeley, CA: National Writing Project.
- National Science Teachers Association. (2017). *Outstanding science trade books for students K–12*. Retrieved from <http://www.nsta.org/publications/ostb/>