HOW CHILDREN AND YOUTH'S INTERESTS DEVELOP

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Clarissa's Story (SLIDE 2)

Clarissa is a 17-year-old aspiring screenwriter, growing up in a working-class household in the San Francisco Bay Area. Her passion is fantasy fiction. When friends introduced her to an online role-playing site called *Faraway Lands* that involved writing fiction interactively, she jumped at the chance to connect with others who shared her interest. Clarissa made great strides in her writing, engaging with it in ways that felt more authentic, and more motivating than her writing classes at school. The Faraway Lands community has high standards for writing and creativity. To join, she had to write a 25,000-word description of a given character in a fantasy, detailing that character's background and history. (25,000 words is 100 double spaced pages!) She received critical feedback on her writing and stories, and she gave peers feedback on their writing as well. She and another online peer from Oregon had, she said, "this sort of thing where we were reviewing each other's work all the time, 'cause he just wanted all the input he could get." She loved the community, because, as she put it, "I am able to fully develop intricate personalities and plots that in computer games, sports and academics are simply not possible."

In the end, Clarissa was proud enough of her work to use it in class assignments and in her college applications. She was admitted to two competitive liberal arts colleges, Emerson and Chapman, and attributes her success to the writing skills she developed in the role-playing world.

Clarissa's story shows the power that interest can play in a young person's life, propelling them into new connections with others, into new educational opportunities far from home, futures where her writing will no doubt play a significant role, and for which her online writing experiences have prepared her (for more on Clarissa's story, see Ito et al., 2013).

Young people like Clarissa may be familiar to parents here in Boulder, but the kinds of opportunities to pursue her interest she found are rare among working class families like her. Just one in five young people in the country get to participate in after-school organized activities, and there's growing evidence that these out of school enrichment activities are key to students' learning and development both in and out of school.

Interest is a catalyst for learning and development. (SLIDE 3)

In recent years, scholars who follow young people over time, across the settings of their lives, that Clarissa's story, find time and again that interests like these are really key

catalysts for development. For the things we are passionate about, we seek out new opportunities to engage with them, whether it's writing or crafting, running or playing music. They lead us to new places, where we can learn new things and try on new identities.

Neuroscientists, too, tell us that we are hard-wired for interest. Interest is related to the brain's "seeking system," the part of our brain that is linked to searching, investigating, and looking for food to satisfy our hunger (Hidi, 2006). We all experience the state of being interested from time to time, which is a state of increased and spontaneous attention, concentration, and feeling.

That attention, concentration, and feeling are all what make interest a key catalyst for our learning and development. It's what made Clarissa seek out feedback on her writing and gave her the courage to bring her writing to school, when she was afraid to because it was for a grade. Interest is what makes you and me push through our fear of not knowing and push aside questions about whether we can do something.

But where are the different places that pursuing our interests can lead us?

Deeper Play (SLIDE 4)
Interest can lead to ever-deeper play. An interest in building LEGO™s, for example, as a child, can lead to engagement in sprawling creations like this one on display now at CU's Old Main. This LEGO™ version of CU's campus was made by the [Colorado and Wyoming LEGO™ User Group](#), a group made up of both hobbyists and professional builders (Master Builders, if you will). This regional user group is one of dozens across the globe who meet regularly to socialize, show off what they have made, and hone their skills as builders.

Play is beneficial for children and adults alike. As the Swiss Child Psychologist Piaget (1951) taught us, play is an integral part of children's intellectual and social development. For adults, play is a way that we connect with others, whether it's building LEGOs, attending a trivia night at a friend's house, or singing songs together at a holiday party. Increasingly, there are ways for people of all ages to connect online with others who share what they like to play. Members of LEGO™ User Groups can find people from around the world easily through [LUGNet](#), a global community of LEGO™ enthusiasts of all ages.

Career (SLIDE 5)
Interest also plays a big role in career choices. In my field of science education, researchers have found that students who express interest in a science-related career by eighth grade are more likely to earn a degree in life science, physical science, or engineering than those with lower interest (Tai, Liu, Maltese, & Fan, 2006). The

majority of students who major in STEM make that choice in high school, and they do so on the basis of interest, rather than achievement (Maltese & Tai, 2011).

As a consequence of findings like these, policy makers and science educators are increasingly focused on identifying strategies for capturing and sustaining young people's interest in STEM-related fields. For example, a recent report of the President's Council of Advisors on Science and Technology called on the field to "create STEM-related experiences that excite and interest students of all backgrounds" (PCAST, 2010, p. v).

Civic Engagement (SLIDE 6)
Interest can also lead young people into the civic sphere. The Harry Potter Alliance, as its name suggests, is an organization that is closely connected to the *Harry Potter* franchise. It is a grassroots, networked organization that is focused on issues related to access to literacy, equality, and human rights. Most—but not all—of the members of local chapters are Harry Potter fans. Themes and storylines from Harry Potter infuse and anchor different HPA campaigns and projects.

One campaign undertaken by the Alliance worldwide was aimed at changing chocolate sourcing for chocolate used by Warner Brothers for Harry Potter merchandise (think Chocolate Frogs, for you Harry Potter fans). Warner brothers was buying its chocolate from merchants who had been identified as involved in human slavery and trafficking. The campaign, though unsuccessful engaged thousands of young people around the world. As founder Andrew Slack wrote about the campaign, "We see our heroes like Albus Dumbledore and Hermione Granger standing up against injustice and they continue to inspire us to do the same."

Harry Potter fans are not the only ones who translate their interests into civic engagement. Some of my colleagues in California have studied how youth participation in interest-related activities online translates into involvement in activities like voting and becoming involved in political causes (Kahne, Lee, & Feezell, 2013).

Where Has Interest Led You? (SLIDE 7)
I'd like to pause now, and ask you a few questions about your own interest-related pursuits in childhood and adolescents.

The questions I will ask you are ones my colleagues and I are asking as part of a study of what we call "Connected Learning." Connected learning is evident when "a young person is able to pursue a personal interest or passion with the support of friends and caring adults, and is in turn able to link this learning and interest to academic achievement, career success or civic engagement" (Ito et al. 2013, p. 4). Our study is focused on analyzing teenagers' experiences of connected learning in organizations like

the Harry Potter Alliance, science museums, and online fan fiction sites like the one Clarissa was part of.

But even though many of us grew up before it was possible to join an online community of fellow enthusiasts of *Star Trek: The Next Generation* or urban planning and design (two of my own high school interests), we no doubt had something that comes to mind when we see these questions:

The Questions (SLIDE 8)
So, I'd like you to turn to a neighbor, if possible, someone you didn't come here with, so that you can meet someone new here at the Chautauqua Community House, and discuss with them:

What is something you did for at least three years during your second decade of life (age 10-20) that:

- You enjoyed doing?
- You got better at the more you did it? *and*
- You looked for opportunities to do more of it, whenever you could?

Once you have thought of that activity, talk to your neighbor about:

- What the activity was
- When you started and stopped doing the activity (if you stopped)
- Who did the activity with you or encouraged you to do it (if anyone)
- Where you did the activity

Let's Hear About our Experiences (SLIDE 9)
As I ask these questions of the group, look around you to notice what you have in common with others in the room.

How many of you:
Named a sport?
Named an artistic pursuit, like dance or music?
Started when you were in middle school?
Started when you were in high school?
Are still pursuing the activity?
Stopped when you went to college?
Did the activity despite having no support from others to do it?
Did the activity with the support or encouragement of a parent or a teacher?
Did the activity with the support or encouragement of a friend?
Engaged in the activity in only one place?
Engaged in the activity in more than one place?

Interests tend to follow institutionalized pathways. (SLIDE 11)
There is a reason that many of us name sports, when asked questions about things we enjoyed and pursued for a long time during adolescence.

There are many opportunities for young people to engage sports, and in a wide range of settings. In school, on the playground informally with friends, in organized leagues.

Cities like Boulder illustrate well that there are often pathways of advancement in sports. As children grow up here, they may go from playing soccer in a league where developing a love of the sport and basic skills are valued over winning, to one where more advanced skills and competitive team play are emphasized. Those pathways are visible to children and parents alike – they talk about them, they debate the merits of this league versus that, this team versus that. A community organizes to support the development of this interest.

But suppose you were a parent of a child who couldn't afford to join one of Boulder's competitive soccer leagues – the fees and equipment were just too much for you, and you didn't know where to find those resources. Or your child wasn't interested in the competitive aspects of the sport.

Let's say, too, that your child wants to develop skill in radio production. Where can she go to develop this skill? Where will she even learn about where she can go to learn about radio production? Perhaps she's fortunate, and there's a program in her high school that gives her access to some equipment. But is there a teacher there who can help her? And does that teacher know where she can apprentice to a real radio engineer?

Pathways like that one aren't as visible or as well supported as the pathways into sports. In addition, all pathways—not just soccer—require resources to support. So, many of our interests get channeled into to pathways that are well supported and for which our families have adequate resources to help fund our involvement.

Other people are important supports for interest development. (SLIDE 12)
We tend to think of our interests as our own, what makes us individuals. Indeed, the particular pathways we follow are idiosyncratic, but we do not make or follow them alone.

What is particularly striking is that regardless of the activity young people in our sample named, nearly all said they had support from a parent, a teacher, or a friend for their involvement. Less than 10 percent said they were "on their own" when it came to pursuing their particular interest-related activity.

Parents, teachers, friends, and afterschool program leaders helped young people in lots of different ways. Young people say that others teach them new things, collaborate with them on projects, help them find information related to their interests, sign them up for things, introduce them to people who know about what they are interested in, give advice, learn from them, and give responsibilities related to their interests.

Parent Roles (SLIDE 13)
Our own findings mirror those of my colleague Brigid Barron and her team at Stanford University. Barron has followed several young people for many years, and investigated the roles that parents have played in helping these young people develop fluency with new technology. The young people come from both Silicon Valley and from inner-city Chicago, but a finding across both of these settings is that the more varied roles that parents played, the more confident young people were in their skills in using a wide variety of computer tools, from word processing to using a programming language to code (Barron, Martin, Takeuchi, & Fithian, 2009).

The parent roles went beyond just teaching their own children what they knew. They included the role of "resource provider," giving things like books, video equipment, or online accounts to young people to help them learn. Parents also played the role of "learning broker," seeking out opportunities for their child by networking, searching the Internet, talking to other parents, and using other sources of information. Signs child up and provides necessary support for endeavor. Parents played the role of "learner," allowing their child to teach them new skills.

Supporting interest development requires providing ways for young people to pursue "curiosity questions." (SLIDE 14)

One of the most valuable ways that parents and other family members can support the development of a young person's interest in something is to give them a means to explore "curiosity questions." Curiosity questions are ones young people formulate that guide their search to better understand the topic that is of interest to them (Hidi & Renninger, 2006). They are the ones my daughter often asks me that I don't know the answer to myself, and have to look up, or say, "let's try and find that out together." They signal a developing interest that can grow, if young people have a way to pursue it.

The Perfumery (SLIDE 15)
My colleagues Leah Bricker of the University of Michigan and Phil Bell at the University of Washington followed a fourth grader, Brenda, over the course of two years (Bricker & Bell, 2014). They went to school with Brenda, and they also visited her at home and in afterschool programs Brenda attended.

One day, Brenda's mother remembers her daughter's interest in mixing things with mortar and pestle when she sees an educational perfumery kit on a store shelf. She buys it, and the two start making perfume together.

The kit she bought contained everything one needed to make perfumes (e.g., different oils, such as peppermint oil, bottles in which to mix the perfumes, plastic pipettes, instructions). A tag line on the box said, "It's real chemistry!" There were instructions that also contained language written in a language that signaled the linkage of the kit to "real science." The instructions talked about control for 'contamination with apparatus', (b) careful measurement of materials during implementation of protocols, (c) tracking and labeling of samples, and (d) systematic journaling of results.

One day, Brenda began to demonstrate the Perfumery and she started by showing the researchers how she had organized the Perfumery materials. All materials were stored in a large Ziploc bag. Each plastic pipette was labeled and rolled in a paper towel. Brenda noted that she had labeled the pipettes (they did not come labeled). Each bottle of perfume oil was stored in a smaller Ziploc bag within the larger bag. As instructed, she had tracked and labeled samples, and she'd conducted several experiments for which she had kept detailed journal records of her observations.

A cousin was often present when Brenda would work with the Perfumery. Her mother was also sometimes involved as a collaborator. The roles Brenda's family members played didn't require technical expertise, but they were important. Buying the kit, observing, and encouraging Brenda to show it to the researchers all signaled to Brenda that her interest was a worthwhile activity.

Hayin's Story (Slide 16)
My colleague Ben Kirshner here at CU is leading a team that developed a partnership with four youth programs, in which youth themselves participated as co-researchers, to study their own programs. His team is looking at the resources and barriers young people face as they try to pursue their interests after they leave the program. As part of their study, young people are interviewing peers and alumni from the programs about their experiences.

Why do this? This is important because in affluent areas we see so much support for interest development that is in the private sector (and becoming more so), but we want to understand the kinds of systems that youth from working class and low-income families navigate to develop and sustain interests. The programs from which we recruited have a specific commitment to equity; the young people don't pay to be part of them, and they are funded through public sources and grants from private and public foundations.

The [Science Research Mentoring Program](#) is a program of the American Museum of Natural History in New York that offers high school students the opportunity to join ongoing research projects lead by AMNH scientists. Students interested in getting accepted for this science research experience must first take three After School Program Science Research courses offered at the museum. These courses prepare students to gain the knowledge and skills necessary for doing science research. They take part in a three-week summer institute and work in the science lab at least four hours a week during the school year. Many of the participants come from groups that are under-represented in science – girls, students from immigrant families, for example.

Hayin is a current participant in the program who has a well-developed interest in science, as evidenced by the fact that she says she routinely looks out for opportunities to engage in science, and as you will hear in this clip from her, she has curiosity questions about scientific phenomena that she pursues. Her story, though, interestingly shows how important the context is for her, even for someone whose interest is well developed. Listen as she describes what the program she participates in at the AMNH is for her: (PLAY CLIP)

> *I really enjoy the fact that I have some sort of academic freedom and the fact that even with this freedom I have some guide to understand exactly what I am doing. Uh As well as the fact that even though I am doing lab work, I know exactly what the end goal is and what we're trying to find and that sometimes is lost in a classroom setting.*

When asked whether she's getting better at doing science, Hayin says:

> *Well, yeah, I hope so, actually. I really hope so because I did other projects during my senior year as well, that involved coming up with your own experiment, and actually doing carrying it out yourself, and we went to a competition in June, we didn't win. Yeah it was awesome, it was at MIT. I learned my skills here, and I applied it to what I learned here. So I think I've gotten a little better.*

Hayin's pathway is one that is marked by some signs of success – of learning and having opportunities to apply what she's learned at the museum to a school project. And at the same time, she contrasts the opportunities she has to do real science at the museum to what's available in school.

The researchers who followed Brenda from home to school noticed the same thing, too, that Hayin mentions, that school wasn't a place where young people could pursue their own questions and wrestle with setting up experiments that might fail. They presented cookbook labs with procedures already laid out. They might illustrate the concept taught, but they took away what was interesting to her.

The need for apprenticeship (SLIDE 17)

It may be a big ask for Brenda's elementary school teacher, and Hayin's high school biology teacher, to engage them in the kinds of experiences that would really give them a chance to do science. I'll come back to that in a moment, but for now, I want to emphasize what AMNH and other sites in our study *do* provide that is a powerful form of support for interest development, namely exposure to and apprenticeship into professional practices of some kind.

Remember that hypothetical young person who is into radio production. Well, if she's fortunate enough to live in a city with a [Youth Radio](#) affiliate, she can pursue that interest. is a program that prepares young people for participation in new media cultural forms such as blogging, online journalism, and video production. Based in Berkeley, California, Youth Radio has affiliate programs across the United States. Selected feature stories and editorials developed by youth in the program are heard regularly on National Public Radio and on local public broadcasting channels.

Youth Radio has a structured [apprenticeship program](#), in which young people learn how to pitch and develop stories, conduct interviews with other youth and adults, and record their stories for distribution (Chávez & Soep, 2005; Soep & Chávez, 2010). They learn from professionals, and they do so by engaging in the same practices that professionals do. They take classes, but the classes engage them directly in all parts of the process. Just as Clarissa's peers on her fan fiction site do, peers learn to engage in a practice of constructive critique that includes critique from people who regularly produce radio shows, including other youth (Soep, 2006).

Sometimes, apprenticeship looks only a little different from school. (SLIDE 18) These pictures show three different programs that are similar to ones in our study. Two are teaching young people skills in fashion design, and the third is focused on spoken word poetry. The kids are sitting listening to an adult talk, much like they might in school. But a key difference here is that these teachers are professional practitioners of the particular skills they are teaching the young people here, and young people get the opportunity to see them engage in their craft as they learn. And the spaces are open, too. Notice how they open up to other spaces, where young people are engaged in other forms of activity.

The spoken word poet here, Brother Mike, is actually at the Harold Washington Library in Downtown Chicago in a place called [YouMedia](#). The library space has been reconfigured for young people, to be a space where they can hang out, explore new digital technologies, or as illustrated here, learn how to do spoken word poetry (Tripp, 2011). This is one of many library spaces around the country that are being reconfigured as "Learning Labs" to support youth interest discovery. There's one of these right down the road in Thornton, at the [Anythink Library](#) there.

School can be a place where young people's interests are developed. (SLIDE 19)

It *is* possible to engage in this sort of apprenticeship learning in school settings in a way that is centered on students' interest. My colleague at CU Joe Polman has developed just such a program, called SciJourn (Polman et al., 2010).

SciJourn is a project that teaches science literacy through journalism. The project is a good example of one that seeks to relate students' interests and experience to disciplinary content. It's unusual, in that it is implemented in both schools and in science museums, and is adapted differently to the different contexts.

A number of high school science teachers implement the program, and evidence from studies of its impact show that students in SciJourn learn valuable skills in critically reviewing science as reported in the popular media. A unique aspect of SciJourn is that students become learn the genre and practice of science journalism by pitching stories to an editor, conducting research on the topic, and then composing and revising stories with feedback from a real science journalist. Their articles are published both in a print newspaper and an online site, Scijourner.org.

Students choose their own topics in SciJourn, and these can range widely in terms of the science domains and topics, depending on their interests. Also, students' direct experience with the phenomena they choose vary widely – some are close to home (e.g., a story about someone considering getting a tattoo on the dangers of tattoos) and others are more distal. Studies of SciJourn, though, show that students in the program develop common science literacy skills that are valuable to helping them participate in public dialogues about science (Polman & Hope, 2014).

Interest is fragile at transitions (SLIDE 20).
The kinds of opportunities provided to students in *SciJourn* and Youth Radio are important models for how to support young people in developing interests, particularly in science and technology related areas. But these experiences are not widely available to youth.

Moreover, lots of young people's interests flag or go dormant at the institutional transitions they make – from middle to high school, from high school to college.

Large survey studies have documented significant declines in young people's interest in science during the middle and high school years (George, 2000). The declines are particularly steep for girls (Osborne, Simon, & Collins, 2003; Simpson & Oliver, 1990; Talton & Simpson, 1985). There is a significant opportunity gap that opens for girls during these years, in terms of their science-related experiences and boys' (Jones, Howe, & Rua, 2000).

We see this in some of the stories of the young people that we are studying now. A young person who—after taking part in a program that boosted her interest in a career in environmental law—gets to the college that she wants to in the area, only to find out there's no obvious pre-law pathway for her to pursue.

Graduates of programs that build interest in science related careers often face isolation when they get to college. They can easily become disheartened by what they perceive to be a competitive and impersonal culture (Adams, Gupta, & Cotumaccio, 2014).

At these moments, young people need support and they need confidence, but our system is not particularly well-designed for that at present.

Ecological Resiliency: Diversity (SLIDE 21)
We need to cultivate a diverse and resilient ecosystem of supports for young people.

An image that is gaining support among researchers and policymakers is thinking about supporting young people's interest and learning as cultivating an *ecology* or *ecosystem.*

No one institution can or should carry the weight of helping young people find or forge pathways into further education, jobs, civic engagement, or even deep play. It's not how interest develops anyway – young people engage in interest-related pursuits *across multiple settings* and *over many years* (Bell et al., 2012). So, the institutions that we need to build to support them must think about carrying them across these settings and through time.

One characteristic of a resilient ecosystem is that it supports a diversity of pathways. We need to be able to support young people who develop interests not just in sports, but in the arts and in emerging fields of both study and work. Technology can be a support, but young people need to be able to afford access to it, and just providing access is not enough. To learn about the many communities that exist online, one needs an "on ramp" of sorts, a way to filter through different possibilities and hopefully a human guide to help.

Interests of Youth in Our Study (SLIDE 22)
Many of the sites in our study are part of an emerging ecosystem that supports more diverse pathways of interest development.
As the chart shows, many of them identified activities they enjoyed that were arts related or "new media arts," as we called them – things like multimedia production and web design that relate to technology. And a lot named sports.

We had chosen these school-based and after-school programs in part because they had a commitment to supporting young people in discovering and pursuing things that

interested them, so it is not surprising that they are at least partly successful in this effort. But as I have pointed out, there are some gaps in the system between different opportunities that are difficult for many to cross.

Ecological Resiliency: Redundancies (SLIDE 23)
Another of the characteristics of a resilient ecosystem is that there are redundancies built in. Lots of ways for a young person, in our case, to get from A to B. That's so in case one particular connection between a setting and another frays or disappears, there's another pathway available. In some ways, that's what advantaged young people who do well in school enjoy now – lots of ways to show success, with lots of support from family members, tutors, and others in case they struggle with a course or get into other kinds of trouble.

Developing pathways for other kinds of interest-related pursuits, for a girl like Clarissa into a professional pathway as a writer, or Brenda into a major in science, presents a challenge, because there are disconnects between the skills they are developing out of school and ones they are developing in school. In addition, the pathways of young people producing new digital arts face uncertain futures in a still-evolving "creative economy." We don't necessarily know how to support them yet.

Brokering is key. (SLIDE 24)
A place to start in cultivating such an ecology as parents and teachers is to focus on a different kind of role than we often emphasize in teacher education programs and parent classes. And that's to focus on what people call "brokering," but that we might also call the work of someone who helps a young person find their next thing.

Laura, a girl at one of our study sites, said that one of the ways that her program at the [Science Museum of Minnesota](#) helped her pursue her interests was with the help of Lauren. She said:

> Well, there's a lady named Lauren, and she has a big role in helping alumni, I don't know, helping them plan for their future, in a sense. So, I definitely seek some of those staff in the KAYC. What they can do to help me is just being full of support, that being emotionally and mentally. Just being there for me and just being really honest and just, I don't know, helping me network and connect with people that they know can further, what do you call it, can help me figure out what I want to do, so, definitely that.

Take care in our words. (SLIDE 25)
Finally, we never know who will make an impression on, and when, by what we say. Taking care how we respond when a young person shows an interest in something or expresses a desire for us to buy something to help them pursue a budding interest is key. I want to leave you with a brief clip from Brother Mike, the spoken word poet at YouMedia whose picture I showed earlier. Brother Mike recently passed away, and the

tributes to him have spoken to the role he played in sparking and developing young people's interests. Here, he talks about how others supported him in pursuing his interests. Listen, as he describes what it is to be mentored and to mentor others in something you are passionate about.

PLAY VIDEO CLIP
Available at: http://vimeo.com/43862075

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