

# SciGirls

## Season Four



## Formative Evaluation Report

### *Latina SciGirls*

#### Rough cut evaluation

#### *Digital Dance* episode and STEM role model video

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## Significant findings

As part of the development work of *Latina SciGirls* (*SciGirls* Season Four), the independent evaluation firm Knight Williams Inc. conducted a formative evaluation focused on gathering input from the project's primary public audiences, Hispanic girls and their parents/guardians. The evaluation was undertaken in order to provide the production team with feedback on issues that arose from the project's front-end evaluation (also coordinated by Knight Williams Inc.) and from *tpt's* early production work on the first *SciGirls* Season Four episode and STEM role model videos.

A total of 89 participants, including 54 girls and 35 parents, were asked to review a 25-minute rough cut Spanish-language version of the *Digital Dance* episode and a 3:21-minute Spanish-language STEM role model video. All of the youth and most of the parents were female. All of the girls and parents were of Spanish, Hispanic, or Latino origin. The average age of the girls was 11, while 40 for the parents, and most participants had little or no prior exposure to *SciGirls*. The majority of girls and parents indicated that they had little to no knowledge of computer science or coding (the STEM topic featured in the episode and role model video), while more than half of the girls and two-thirds of the parents were somewhat or very interested in this topic. None of the parents worked in a STEM field, and the girls shared a range of favorite subjects, including science, math, and language arts.

The main findings that emerged from the formative evaluation are summarized below:

- ***Appeal of the episode:*** Overall, girls and parents liked the *Digital Dance* episode, found it interesting, liked the music, felt the episode increased their interest in computer science/coding, and thought they would recommend it to friends. Girls tended to rate the episode as somewhat clear, while parents found it clear. Girls were neutral about whether they could relate to the story, while parents found it somewhat relatable.
- ***Whether the SciGirls are likeable, relatable, and good role models:*** More than four-fifths of girls and parents *somewhat liked-to-liked* the episode. About a third of the girls indicated that they could relate to the *SciGirls* in the episode, while the majority of their parents expected this would be the case. The girls who said they *could relate* most often pointed to shared personal attributes or a shared interest in science. Those who said they *couldn't relate* or *weren't sure* most often indicated that they felt this way because they didn't have as much exposure to science or technology compared to the *SciGirls* or that they did not "do" coding or digital projects. However, girls and parents generally agreed that the *SciGirls* in *Digital Dance* were good role models, and throughout their surveys a number of girls noted that the *SciGirls'* friendships and positive attitudes made them relatable role models.
- ***Episode's showcasing of the SciGirls Seven:*** When asked to rate how good a job the episode did in showing the *SciGirls* participating in ways reflective of the *SciGirls Seven*, girls and parents both generally rated the episode as doing an *excellent job* of showing the *SciGirls* working together and being creative and unique together. On each of the remaining ways of participating (asking questions and exploring, not being afraid to make mistakes, connecting with their role models and mentors, motivating others, doing a project that is personally relevant and meaningful, and using STEM to change the world), the girls generally rated the episode as doing a *good job* while the parents rated the episode as doing an *excellent job*.

- ***Episode's focus on the SciGirls' Hispanic cultural background and integration of families:*** About two-thirds of the girls and three-quarters of the parents thought the episode's focus on the SciGirls' Hispanic cultural background was about right. Those who thought there was the right amount of focus most often praised some aspect of the episode's focus on the SciGirls' cultural background, especially the focus on family and the focus on their background and country of origin, including how the episode connected their cultural background to their daily lives. Additionally, in the brief discussion sessions held after participants completed their surveys, some participants elaborated on how well they thought the episode highlighted the SciGirls' different experiences and cultural backgrounds. A fifth each of girls and parents thought there was too much focus on the SciGirls' cultural background, and more than a tenth each of girls and parents thought there was too little focus.
- ***Episode's use of Spanish, Spanglish, and bilingualism:*** Girls and parents generally liked seeing the SciGirls talk in Spanglish, liked seeing the SciGirls being bilingual, and liked that the episode was mostly in Spanish. In all, about a fifth of girls and a third of parents indicated that they *disliked* or *somewhat disliked* seeing the episode in Spanish. Some of the girls who expressed a preference for English noted that they felt more *comfortable* with English, as it was their *first language* or more *relatable*, and as such could benefit from captions in instances where they might otherwise be thrown off or confused by the featured SciGirls' language errors. While they tended to raise similar issues to those pointed out by their daughters, a few parents further reflected on their own experience of moving to the U.S. and having a strong conviction to learn English, and to provide opportunities for their children to do the same and use English consistently. Several participants, both girls and parents, suggested that the use of captions would help address the issue of wanting to see more English in the episode, while also helping those who may have trouble understanding the Spanish.
- ***Episode's impact on understanding of and interest in coding/technology:*** Overall, participants felt that the science/technology featured in the episode's design project scenes was a little *too much* and a little *too complicated*. Throughout their surveys, however, many girls and parents expressed particular interest in the technology or coding aspects of the episode, and the majority indicated that they would like to try a science/technology project of their own or with their daughters after viewing.
- ***Appeal of role model video:*** Overall, girls and parents liked the role model video, found it interesting to watch, liked the music, felt the video increased their interest in computer science/coding, and expected they would recommend it to friends. Throughout their surveys, some of the girls and parents suggested that they would have liked to know more about the role model's personal life or work, and a few suggested adding more English or adding subtitles.
- ***Whether the role model in the video is relatable:*** About two-fifths of girls indicated that they could relate to the role model, while the majority of their parents expected this would be the case. The girls who said they *could relate* most often said that they liked an aspect of the role model's personality (e.g., *talkative, creative, positive*) or that they shared interests. Some also pointed to the fact that she is Latina and a good role model in general, or said they too liked tech/coding. Those who said they *couldn't relate* or *weren't sure* if they could relate most often indicated that they felt this way because they weren't interested in coding or computer science or because the role model was considerably older.

# Introduction

Beginning in September 2015, with funding from the National Science Foundation (NSF), Twin Cities Public Television (*tpt*) initiated the three-year project *Latina SciGirls: Promoting Middle School-Age Hispanic Girls' Positive STEM Identity Development*. The cornerstone of the project is a fourth season of the Emmy Award-winning television and transmedia project *SciGirls*, to premiere in 2017, in this case involving six half-hour *SciGirls* episodes filmed in Spanish showing groups of Hispanic girls and their Hispanic STEM mentors investigating science and engineering problems. The television program will be accompanied by a series of family and girl-friendly online role model video profiles in Spanish and English featuring Latina STEM professionals.

Beyond these two core media components, the project will provide opportunities to connect girls and their families with in-person Latina role models and STEM programming via community outreach through a network of Hispanic-serving partner organizations in diverse Hispanic communities. The project will also facilitate an independent research study on the development of STEM identity among girls participating in the project.

Taken together, as summarized in the NSF proposal, the project has four primary objectives/deliverables:

- ❖ Objective/Deliverable One: Develop a six-episode Spanish-language television series following groups of Hispanic middle school girls and their Latina STEM professional mentors as they investigate scientific or engineering problems.
- ❖ Objective/Deliverable Two: Develop a series of 12 Spanish-language role model video profiles of Latina STEM professionals that portray the everyday life of a scientist or engineer.
- ❖ Objective/Deliverable Three: Provide the *SciGirls* network of Hispanic-serving partner organizations with media resources, professional development, and opportunities to connect Hispanic girls and families with Latina STEM professional role models.
- ❖ Objective/Deliverable Four: Investigate the intended development of positive STEM identities for Hispanic girls and their families through an associated research effort.

As part of *tpt*'s planning for the first two deliverables, the television program and video profiles, the independent evaluation firm Knight Williams Inc. conducted a front-end evaluation focused on gathering input from *Latina SciGirls*' primary public audiences (Latina girls and their parents/guardians) and professional audiences (the project's advisors and partners). Scheduled early in Year 1 of the three-year project, the evaluation provided an opportunity for *tpt* to assess, prior to any production work, the extent to which the feedback validated the project team's key assumptions in planning *Latina SciGirls*, including the importance of: developing a Spanish-language program, featuring more authentic and culturally appropriate story lines, and showcasing Latina role models, both STEM professionals and girl peers. These assumptions were based on *tpt*'s extensive experience directing past *SciGirls* projects, prior external evaluations of *SciGirls en Familia* and *SciGirls en Español*, and review of the literature. The front-end work in essence helped to serve as a check on these assumptions as applied to *Latina SciGirls* and also helped inform specific production decisions. A copy of the report on this work can be found on the [tpt STEM evaluations site](#).

This report presents findings on a formative evaluation the independent evaluation team subsequently undertook to provide the production team with feedback on issues that arose from the front-end evaluation findings and from *tpt's* early production work on the first Season Four episode and STEM role model videos. In planning the evaluation, the project and evaluation teams met frequently to determine goals to ensure that the information gathered could be directly used to inform production decisions.

## Method

The formative evaluation gathered target audience feedback on a 25-minute rough cut Spanish-language version of the *Digital Dance* episode and a 3:21-minute Spanish-language STEM role model video. The evaluation recruited independent samples of girls and parents/guardians matching the target audience for *Latina SciGirls* identified in the NSF grant: low-to-moderately-low-income Hispanic girls ages 8-13 and their parents/guardians.

Evaluation sessions took place in community center settings in four sites around the country: Sacramento, CA; Nashville, TN; Princeton, NJ; and Miami, FL. Recruiting focused on locating participants who were bilingual because the episode, although filmed in Spanish, also incorporated the use of English and Spanglish; therefore it was considered important for participants to be able to understand and comment on the episode's language use.

The evaluation sessions were conducted over a two-hour period. The evaluation coordinators leading the sessions introduced themselves as part of the independent evaluation team working with *tpt* to gather feedback that would be used to inform the production of *SciGirls* Season Four episodes. They noted that the final episodes would be filmed in Spanish with English subtitles and would be available via PBS, pbskids.org, YouTube Univision, other (web) venues, and through outreach partner events. The coordinators also provided basic background information about each media piece to be viewed, with caveats about their rough cut nature, including aspects of the sound, picture, and color quality that would be corrected in the final versions.

Finally, the coordinators provided participants with a brief overview of the session schedule and reminded them of information they had been told during recruiting: that their participation was completely voluntary, there were no right or wrong answers, that their frank and honest feedback was appreciated and would be used to help inform a new season of *SciGirls* episodes and role model videos, and that all feedback would be reported in the aggregate, with no names or identifying information used in the reporting to the *SciGirls* team. For participating in the evaluation session each daughter-parent pair received an honorarium of \$65.00.

The evaluation session was broken into the following four phases:

- 1) Participants completed pre-viewing questionnaires in English or Spanish that contained general demographic background questions directed at understanding participants' age, gender, race/ethnicity, country of origin, prior knowledge of and interest in coding and computer science (the STEM topic featured in the episode and role model video), and prior exposure to *SciGirls*. Girls were also asked to list their favorite subject in school and parents/guardians were asked to describe their occupation.

- 2) Participants viewed the entire rough-cut in Spanish and then completed a questionnaire in English or Spanish designed to gather their feedback on the episode's appeal, comprehensibility, narrative engagement, learning value, and motivational impact. The evaluation also explored participants' reactions to the episode's use of Spanish, Spanglish, and bilingualism, inclusion of families and the SciGirls' Hispanic cultural background, use of SciGirls and Latina STEM professionals as relatable and effective role models, and portrayal of the SciGirls working on technology projects.
- 3) Participants viewed the STEM role model video in Spanish and then completed a questionnaire in Spanish or English designed to gather feedback on the video's appeal and the relatability of the featured role model.
- 4) Finally, participants participated in a brief follow-up group discussion in English and/or Spanish designed to elaborate on the quantitative survey data and gather additional feedback about the episode or role model video that may not have been elicited through the survey method.

## **Analysis**

Basic descriptive statistics were performed on the quantitative data generated from the evaluation. A reliability analysis was performed on all scaled items using Cronbach's alpha, the results of which are reported in the text. Although a common rule-of-thumb is that coefficient alpha should be .70 or higher (Nunnally & Bernstein, 1994) this convention has at times been called into question, with some suggesting a wider range of internal consistencies be considered (McCrae et al., 2011).

Content analyses were performed on the qualitative data generated in the open-ended questions. The analysis was both deductive, drawing on the project's goals and objectives, and inductive, looking for overall themes, keywords, and key phrases. All analyses were conducted by two independent coders. Any differences that emerged in coding were resolved with the assistance of a third coder.

# Participant information

Among the 89 participants in the *Latina SciGirls* formative evaluation, 54 were youth and 35 were parents.<sup>1</sup> While a total of 40 parents<sup>2</sup> attended the evaluation, five chose not to complete a questionnaire and instead provided informal feedback during the discussion sessions.

**Gender balance:** All (100%) of the youth were female while three-quarters (74%) of the parents were female, as shown in Table 1.

**Age range:** The girls ranged in age from 8-14 while the parents ranged in age from 25-67. The mean ages were 11 for girls and 40 for parents.

**Spanish, Hispanic, or Latino origin:** All of the youth (100%) and parents (100%) were of Spanish, Hispanic, or Latino origin. More than four-fifths (85%) of the parents were born outside the U.S. Their countries of origin included: Mexico (32%), Cuba (13%), Guatemala (10%), Puerto Rico (7%), Nicaragua (5%), Peru (5%), Honduras (5%), El Salvador (5%), Costa Rica (2%), and Columbia (2%).

**English language learners.** As part of the recruiting process, the evaluation team did not specifically identify whether the participating girls were active English language learners (ELL) participating in language support programs. The recruiting criteria for the project required that the girls be bilingual and from mid to low socioeconomic status (SES) Hispanic families per the grant target audience, and that their parents be from diverse countries of origin. All the girls, meanwhile, were second generation English speakers born in the U.S. It is estimated that at least half, likely more, of the girls were ELL.<sup>3</sup>

Table 1. Participants' demographic/ background information (N=89)			
Demographic/ background factor	Categories	Youth (n=54)	Parents (n=35)
Gender	Female	100%	74%
	Male	0%	26%
Age Group	Age range	(8-14)	(25-67)
	Mean	11	40
Seen <i>SciGirls</i> Before?	Yes	4%	0%
	No	96%	100%
Country of origin	Mexico		32%
	Cuba		13%
	Guatemala		10%
	Puerto Rico		7%
	Nicaragua		5%
	Peru		5%
	Honduras		5%
	El Salvador		5%
	Costa Rica		2%
	Columbia		2%
Parents work in STEM field?	Yes		0%
	No		100%
Girls' favorite school subject	Science	32%	
	Math	28%	
	Language arts	25%	
	Social studies	8%	
	Technology	2%	
	Physical education	2%	

<sup>1</sup> Although the evaluation was open to parents and guardians, only parents ended up participating in the evaluation, so the report will only refer to parents from this point forward.

<sup>2</sup> Note that 14 parents attended with 2 daughters.

<sup>3</sup> To help interpret some of the formative evaluation's language findings in context, it might be helpful to refer to recent findings on English proficiency and bilingualism among Hispanics in the U.S as well as studies on language use in PBS television programs designed to appeal to Hispanic children in the U.S. For example:

- <http://www.pewhispanic.org/2015/05/12/english-proficiency-on-the-rise-among-latinos/#trends-in-english-proficiency-among-hispanics-by-nativity-and-age>
- [http://www.air.org/sites/default/files/downloads/report/NEW\\_-\\_Common\\_ELL\\_TERMS\\_AND\\_DEFINITIONS\\_6\\_22\\_10\\_0.pdf](http://www.air.org/sites/default/files/downloads/report/NEW_-_Common_ELL_TERMS_AND_DEFINITIONS_6_22_10_0.pdf)
- <http://www.pewhispanic.org/2012/04/04/iv-language-use-among-latinos/>



**Parents' occupation:** When the parents were asked about the type of work they do, none of the parents (0%) indicated they worked in a STEM field. The types of jobs they listed most often involved either house cleaning or office, grocery store, restaurant, or day care work.

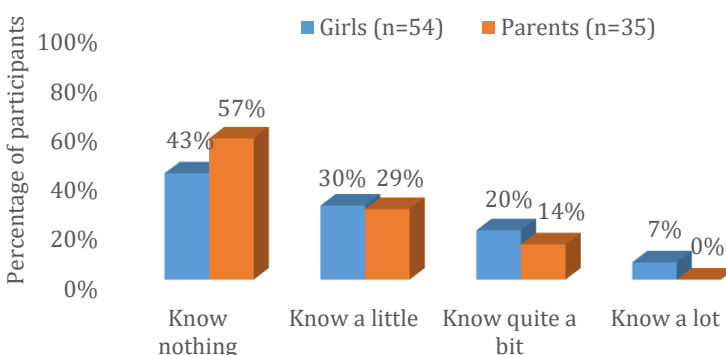
**Girls' favorite subjects:** When the girls were asked about their favorite subjects prior to seeing the episode, the three most popular subjects listed were science (32%), math (28%), and language arts (25%), followed by social studies (8%), technology (2%), and physical education (2%).

**Prior exposure to SciGirls:** None of the parents had previously seen any *SciGirls* television shows or videos, although a small number (4%) of girls had.

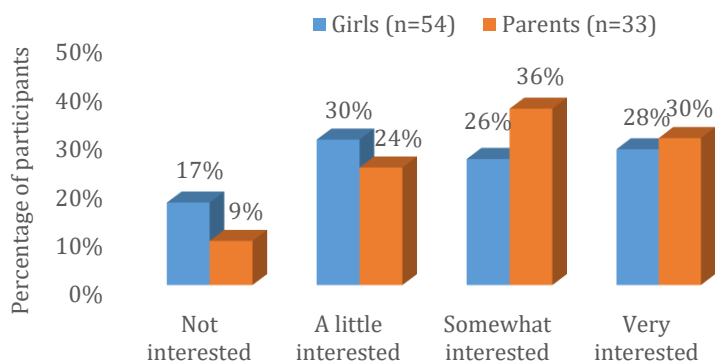
**Prior knowledge of computer science/coding:** As shown in Figure 1, when asked about their knowledge of computer science or coding, three-quarters (73%) of the girls and nearly nine-tenths (86%) of the parents reported that they *knew nothing or a little* about computer science or coding.

**Prior interest in computer science/coding:** As shown in Figure 2, when asked about their interest in computer science or coding, more than half (54%) of the girls and two-thirds (66%) of the parents reported they were *somewhat or very interested*.

**Figure 1. Participants' knowledge of computer science/coding prior to the evaluation**



**Figure 2 Participants' interest in computer science/coding prior to the evaluation**



- <http://www.latimes.com/local/california/la-me-latino-immigrants-english-fluency-20160422-story.html>
- <http://www.pewresearch.org/fact-tank/2015/03/24/a-majority-of-english-speaking-hispanics-in-the-u-s-are-bilingual/>
- <http://link.springer.com/article/10.1057/palgrave.lst.8600274>

# Findings

The *Latina SciGirls* formative evaluation findings are presented in two parts, as follows:

## **Part 1: Participants' feedback on the rough cut episode *Digital Dance***

The Part 1 findings are presented in 11 sections:

- 1.1 First words that came to participants' minds to describe how they felt about the episode*
- 1.2 How appealing participants found the episode*
- 1.3 The most interesting things participants felt they learned from the episode*
- 1.4 Extent to which participants experienced narrative transportation, story involvement, and character involvement watching the episode*
- 1.5 Whether participants felt the SciGirls are relatable*
- 1.6 Whether participants felt the SciGirls are good role models*
- 1.7 How much participants liked seeing the SciGirls work together and with mentors*
- 1.8 How participants felt about the episode's use of Spanish, Spanglish, and English*
- 1.9 How participants felt about the episode's focus on the SciGirls' Hispanic cultural background*
- 1.10 How participants felt about the episode's integration of families in key scenes*
- 1.11 How participants responded to various aspects of the SciGirls project and science process/engineering design scenes*

## **Part 2: Participants' feedback on the STEM role model video**

The Part 2 findings are presented in 5 sections:

- 2.1 How appealing participants found the video*
- 2.2 How interesting participants found aspects of the video*
- 2.3 Whether participants felt the featured role model was relatable*
- 2.4 Whether participants were interested in hearing about challenges or barriers the role model faced*
- 2.5 Other information participants wanted to know about the role model*

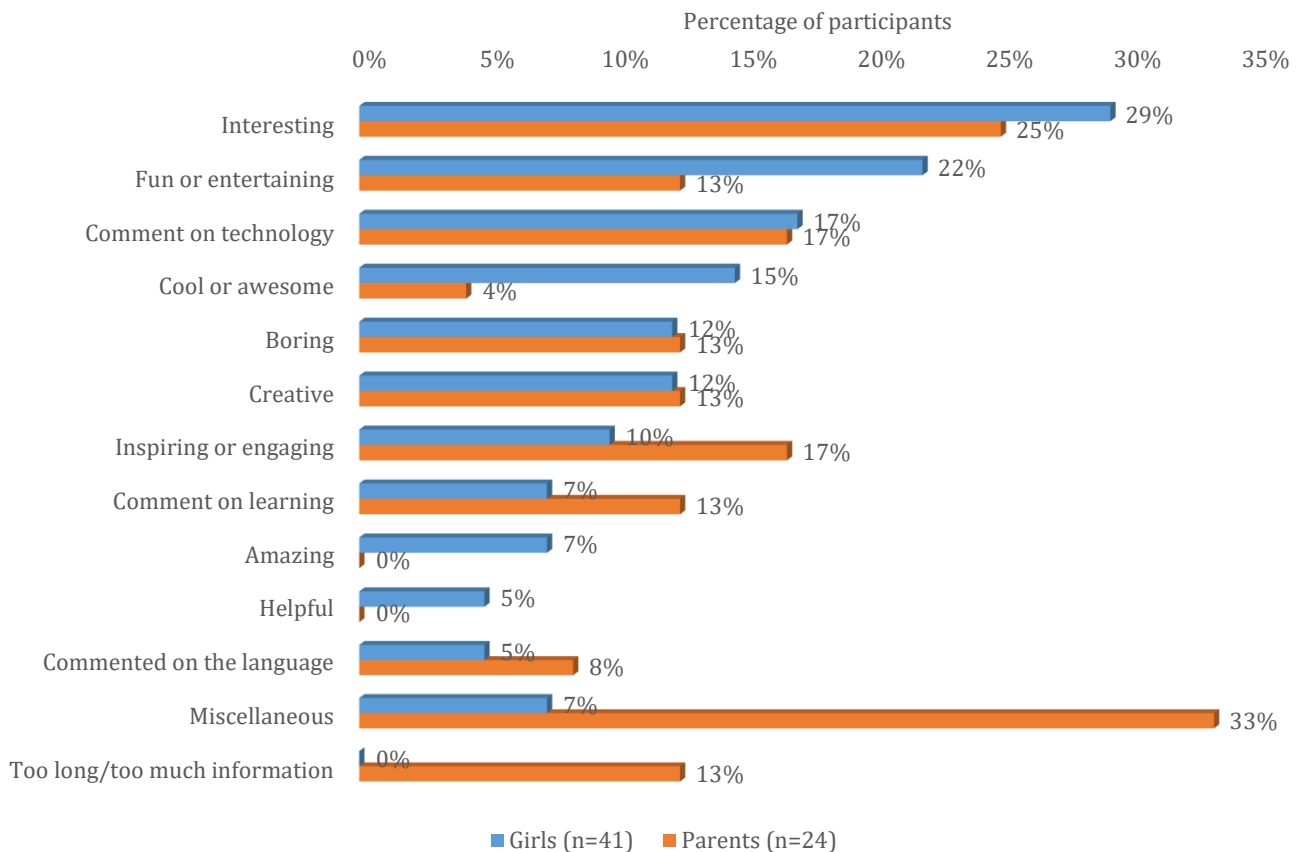
# Part 1: Participants' feedback on the rough cut episode *Digital Dance*



## 1.1 First words that came to participants' minds to describe how they felt about the episode

Participants were asked to share the first words that came to mind to describe how they felt about the episode. Figure 3 presents the types of responses shared by girls and their parents.

**Figure 3. First words that came to participants' minds after viewing**



Responses from girls and parents are summarized below, followed by examples of their specific comments, with feedback from both groups presented together.

**Girls:** Among the 41 girls who shared a response, over one-quarter (29%) used the word *interesting*, while more than one-fifth (22%) described the program as *fun* or *entertaining*. More than one-tenth each commented on technology (17%), used the words *cool* or *awesome* (15%), described the program as *boring* (12%), or used the word *creative* (12%). A tenth (10%) wrote about being inspired or engaged, and less than one-tenth each commented on learning (7%), described the program as *amazing* (7%), said the program was *helpful* (5%), mentioned the language (5%), or shared miscellaneous feedback (7%).

**Parents:** Among the 24 parents who shared a response, the largest group, a third (33%), shared miscellaneous comments. One-quarter (25%) found the program *interesting*, and more than one-tenth each commented on technology (17%), described the program as inspiring or engaging (17%), thought it was *fun* or *entertaining* (13%) found it *boring* (13%), described it as *creative* (13%), commented on learning (13%), or felt it was too long or contained too much information (13%). Less than a tenth each commented on the language (8%) or described the program as *cool* or *awesome* (4%).

#### **Interesting**

- Girl: *The first words that came to my mind was that coding/computer science is more interesting than I thought.*
- Girl: *I thought the video was very interesting overall.*
- Parent: *I was impressed. Fun and interesting.*

#### **Fun or entertaining**

- Girl: *The stuff they do is fun.*
- Girl: *...fun, entertain*
- Parent: *Fun environment.*

#### **Commented on the technology**

- Girl: *Computer science, coding, light up.*
- Girl: *I like how they showed all the technology and science.*
- Girl: *It is a good thing to learn technology*
- Parent: *The conversion from something simple to turn it into something big with technology.*

#### **Cool or awesome**

- Girl: *Really cool technology.*
- Girl: *I thought that was awesome*
- Parent: *Awesome!*

#### **Boring**

- Girl: *A little boring...not what I expected.*
- Parent: *Bored.*

#### **Creative**

- Girl: *Creative.*
- Parent: *Art.*

#### **Inspiring or engaging**

- Girl: *Super inspiring.*
- Girl: *I want to do that.*
- Parent: *Empowering young girls*
- Parent: *Engaging*

### **Commented on learning**

- *Girl: ...you can learn a new thing.*
- *Girl: Informative.*
- *Parent: Educational*
- *Parent: To learn and how to do science*

### **Amazing**

- *Girl: Amazing (What the girls can do in one week)*

### **Helpful**

- *Girl: Helpful.*

### **Commented on the language**

- *Girl: It was hard to understand. It needed the English subtitles or should also be available in English.*
- *Parent: Girls spoke Spanish as if not comfortable in the language. I could tell they prefer to speak English.*

### **Too long or too much information**

- *Parent: I believe the episode was too long and will be hard to keep a younger child focused.*
- *Parent: Long, too much extra information.*
- *Parent: Too long.*

### **Miscellaneous**

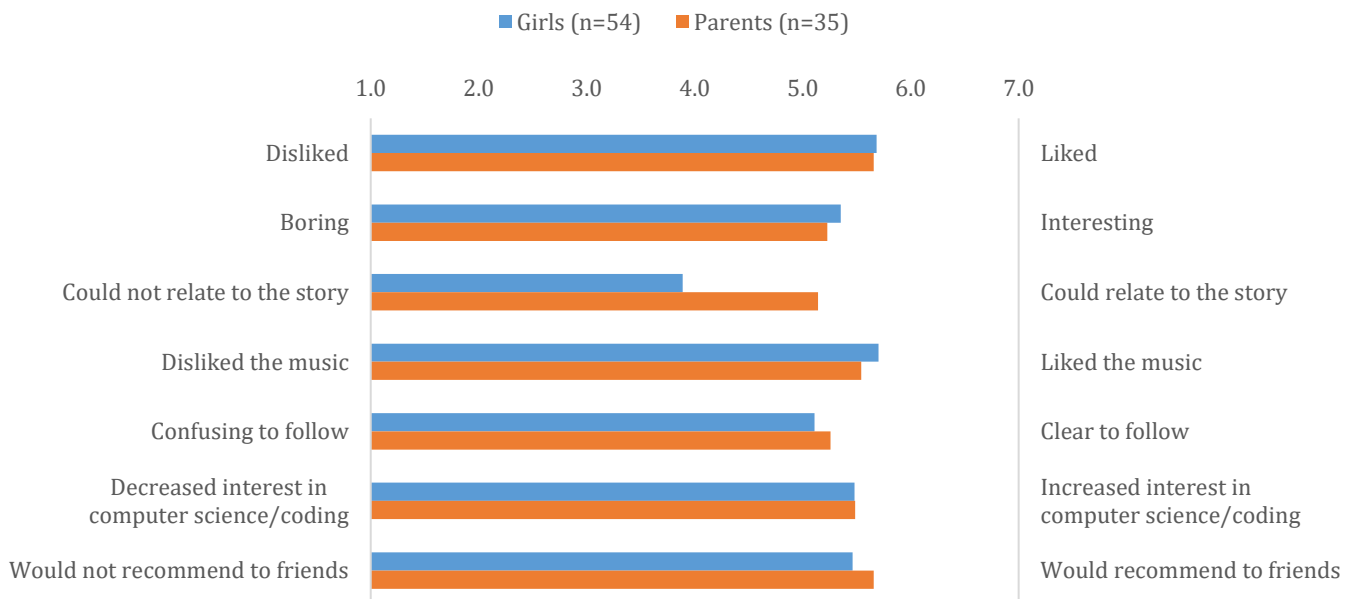
- *Girl: Pretty.*
- *Girl: Wow.*
- *Girl: I can totally relate to being in NY!*
- *Parent: This is very nice*
- *Parent: Unusual for the girls to see*
- *Parent: Team work*

## 1.2 How appealing participants found the episode

Participants were asked to rate aspects of the appeal of *Digital Dance*, including the extent to which they liked the episode, found it interesting or boring to watch, felt they could or couldn't relate to the story, liked or disliked the music, found the episode clear or confusing to follow, felt the episode increased or decreased their interest in computer science/coding, and thought they would or wouldn't recommend the episode to friends. In each case, they used a scale from 1.0 (rated the lowest) to 7.0 (rated the highest).

Based on these indicators of appeal, the overall scale means show that both girls and parents generally found the episode appealing (Girls:  $M = 5.2$ ,  $SD = 1.07$ ; Parents:  $M = 5.4$ ,  $SD = 1.34$ ).<sup>4</sup> Figure 4 presents the mean ratings for the individual items for both groups. Responses from both groups of participants are summarized below, followed by examples of their comments about their ratings.

Figure 4. Participants' mean ratings of the episode's appeal



**Girls:** Though they shared a range of ratings in each case, as shown in Table 2 on the next page, the mean ratings indicated that, overall, the girls liked the episode ( $M = 5.7$ ,  $SD = 1.51$ ), found it interesting to watch ( $M = 5.4$ ,  $SD = 2.05$ ), liked the music featured ( $M = 5.7$ ,  $SD = 1.46$ ), felt the episode increased their interest in computer science/coding ( $M = 5.5$ ,  $SD = 1.79$ ), and thought they would recommend the episode to friends ( $M = 5.5$ ,  $SD = 1.78$ ). They tended to rate the episode as somewhat clear ( $M = 5.1$ ,  $SD = 1.93$ ) and were neutral about whether they could relate to the story ( $M = 3.9$ ,  $SD = 1.85$ ).

<sup>4</sup> Cronbach's alpha for this seven-item scale in the current evaluation is as follows: Girls  $\alpha = .71$ , 95% CI [.57, .81]; Parents  $\alpha = .91$ , 95% CI [.86, .95]. This scale has been used previously by the authors in studies of science-based film and television documentaries.

Table 2. Frequency distribution of girls' ratings of the episode's appeal (n=54)								
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	
Disliked	6%	0%	0%	11%	17%	31%	35%	Liked
Was boring to watch	11%	2%	4%	13%	13%	9%	48%	Was interesting to watch
Couldn't relate to the story	17%	6%	15%	28%	19%	4%	13%	Could relate to the story
Disliked the music	0%	4%	4%	17%	15%	17%	44%	Liked the music
Confusing to follow	9%	2%	9%	15%	11%	20%	33%	Clear to follow
Decreased my interest in computer science/coding	9%	0%	2%	7%	26%	15%	41%	Increased my interest in computer science/coding
Would not recommend to friends	9%	0%	4%	6%	20%	26%	35%	Would recommend to friends

**Parents:** Though they shared a range of ratings in each case, as shown in Table 3, in general the parents indicated that they liked the episode ( $M = 5.7, SD = 1.39$ ), found it interesting to watch ( $M = 5.2, SD = 1.93$ ), liked the music featured ( $M = 5.5, SD = 1.59$ ), found the episode clear ( $M = 5.3, SD = 1.67$ ), felt the episode increased their interest in computer science/coding ( $M = 5.5, SD = 1.79$ ), and thought they would recommend the episode to friends ( $M = 5.7, SD = 1.85$ ). Parents tended to be slightly little less positive about whether they could relate to the story ( $M = 5.1, SD = 1.57$ ).

Table 3. Frequency distribution of parents' ratings of the episode's appeal (n=35)								
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	
Disliked	0%	6%	3%	9%	17%	34%	31%	Liked
Was boring to watch	9%	6%	6%	6%	11%	34%	29%	Was interesting to watch
Couldn't relate to the story	0%	9%	9%	14%	20%	26%	23%	Could relate to the story
Disliked the music	3%	6%	0%	14%	14%	29%	34%	Liked the music
Confusing to follow	3%	6%	11%	6%	14%	37%	23%	Clear to follow
Decreased my interest in computer science/coding	3%	3%	3%	17%	20%	17%	37%	Increased my interest in computer science/coding
Would not recommend to friends	6%	6%	3%	6%	11%	20%	49%	Would recommend to friends

When invited to explain their ratings, most girls and more than half of the parents shared additional feedback. Girls most often discussed: aspects of the episode they liked, aspects they found confusing, aspects where they desired more interest or pizzazz, and issues with language and length. Parents also pointed to aspects they liked, as well as language and length issues, and a few expressed an interest in showing less background information about the SciGirls. Examples of comments in each area are shared below, with feedback from both groups presented together.

### **Aspects liked**

- *Girl: It was very interesting to watch. I like the way that they're talking Spanish because any other tv show is talk in English.*
- *Girl: Overall, I thought the episode was very well done and talked a lot about coding and how young girls can make a difference. Good as is*
- *Girl: I really liked how they used science and technology to do all the lights. It was very interesting...*
- *Parent: I am always hearing how coding will be such an important part of the future. My girls do not seem interested in programming but both love and excel in Math. I think after seeing this video, coding would peak their interest.*
- *Parent: I enjoyed the girls and how the message showed that their interested in taking care of the community.*
- *Parent: I would like my daughter having this in her school.*

### **Confusing aspects**

- *Girl: They could have explained more of the technology they were working with.*
- *Girl: There were parts where I was confused how to do coding, because I don't really know much about computers.*
- *Girl: I could not understand what was happening until the very end when they said they were doing a dance.*

### **Want more pizzazz (color, energy, characters)**

- *Girl: Put more colors, put cameras, more music, more shiny things*
- *Girl: The SciGirls episode would be better if it had more characters...*
- *Girl: I suggest that the girls should speak louder and with energy because they are in a tv show and it is a once in a lifetime opportunity.*

### **Show less background**

- *Parent: Too much on the background of the girls. Should begin with an explanation of their goal.*
- *Parent: I didn't like the part where you showed the girls' [lives], maybe if it was done in the beginning it would have been better and focused the rest of the show on what it was about, computer programming.*

### **Language issues (SciGirls' Spanish hard to follow, want more English, needs subtitles)**

- *Girl: Also the girls' Spanish should be better.*
- *Girl: Please add some English subtitles because some kids who would like to watch it and can't speak Spanish. At least, they could speak more English.*
- *Girl: I think there should have been English subtitles, the girls should have spoken slower and they should have talked clearer.*
- *Parent: Improving the language of those who participate in the video because they speak between English and Spanish sometimes. 100% Spanish is for Latin people.*
- *Parent: I think English subtitles are a must, if not, do it in Spanglish (a combination of the two languages) It's clear the kids are fluent in both and you'd reach a wider audience with both.*

### **Too long**

- *Girl: ...for Digital Dance, but please make it a little shorter, it was so loooooong.*
- *Parent: Shorten the episode to half.*

### **Miscellaneous**

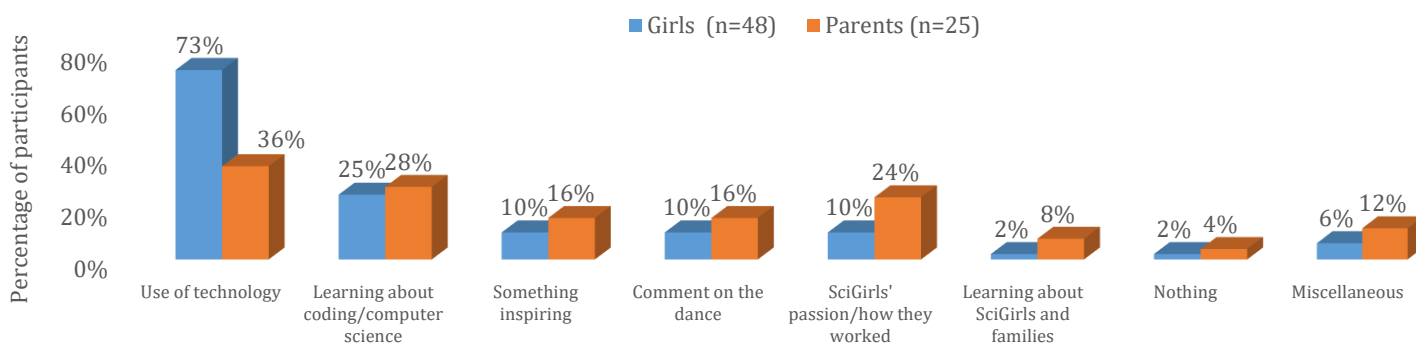
- *Girl: I would like it better with better music and different pictures.*
- *Girl: Maybe take away the part they showed their family.*
- *Parent: I think it's good the only thing is to get better music.*
- *Parent: The quality of the show seemed poor. The girls are probably more interesting than what was shown in the clips on each of them. It looked like it was filmed on someone's iPhone.*



## 1.3 The most interesting things participants felt they learned from the episode

Participants were asked to share the most interesting things they learned from watching the episode. Figure 5 presents the types of responses shared by girls and their parents.

Figure 5. Most interesting things participants learned from the episode



Responses from girls and parents are summarized below, followed by examples of their specific comments, with feedback from both groups presented together.

**Girls:** Among the 48 girls who shared a response, nearly three-quarters (73%) mentioned the use of technology in the project. A quarter (25%) pointed to something they learned about coding or computer science, and a tenth each commented on something inspiring (10%), the dance (10%), or seeing the SciGirls' passion and how they worked (10%). Less than one-tenth each mentioned learning about the SciGirls and their families (2%), said there was nothing they found interesting (2%), or shared miscellaneous feedback (6%).

**Parents:** Among the 25 parents who shared a response, more than a third (36%) mentioned the use of technology in the project, while over a quarter (28%) pointed to something they learned about coding or computer science. Less than a quarter (24%) found it interesting to see the SciGirls' passion or how they worked. More than a tenth each commented on something inspiring (16%), the dance (16%), or shared miscellaneous feedback (12%). Less than a tenth each mentioned learning about the SciGirls and their families (8%) or said there was nothing they found interesting (4%).

### Use of technology in the project

- *Girl: The lights that were on the skirts how they put pictures and songs on the computer.*
- *Girl: I thought the spheres were REALLY cool. I liked learning how they used them.*
- *Girl: How you can do many things with technology. How cool technology works. We can do many things with technology.*
- *Parent: I loved how the use of coding, animation and technology made a simple dance come to life.*

### Learning about coding/computer science

- *Girl: I learned that coding isn't just on the computer. I learned that coding isn't just applied to video games and websites.*
- *Girl: Girls as young as 14 were coding and understanding the principles of coding...*
- *Parent: Learning how the computer programs work basically, and I am interested in learning more like watching another episode with another project the girls do.*
- *Parent: How kids can get involved in computer science and learn different ways to make something simple more interesting.*

### **Found something inspiring**

- *Girl: I learned that it is hard to do coding, but you shouldn't give up.*
- *Girl: I also learned that following your dreams is good.*
- *Parent: Also, that if my kid knows about technology it should motivate me as a parent to know about technology*

### **Commented on the dance**

- *Girl: How they made their own dance*
- *Parent: I loved how the use of coding, animation and technology made a simple dance come to life.*

### **Seeing the SciGirls' passion/how they worked**

- *Girl: That they are working together.*
- *Girl: Girls as young as 14 were coding...really pushing themselves and if they made a mistake they fixed it right away.*
- *Parent: Coding & technology is usually a field more for boys. I loved the passion these girls had for the subject.*
- *Parent: I liked how the girls gave their effort. I just wished they would show the effort in families and community.*

### **Learning about the SciGirls and their families**

- *Girl: The most interesting things were the videos of the girls in their homes, where they introduced their families and shared their interests.*
- *Parent: I loved learning about the girls' families.*
- *Parent: What is interesting is the parents' support for the children and the interest they show in the study.*

## **1.4 Extent to which participants experienced narrative transportation, story involvement, and character involvement watching the episode**

Participants were asked to rate their level of agreement with a series of statements about the episode that measured narrative transportation, story involvement, and character involvement on a scale from 1.0 (*strongly disagree*) to 7.0 (*strongly agree*), with 4.0 being neither agree or disagree in each case.<sup>5</sup>

### **1.4a Participants' ratings of narrative transportation**

Participants were asked for their level of agreement with five statements designed to measure the extent to which they experienced transportation while watching the episode, on a scale from 1.0 (*strongly disagree*) to 7.0 (*strongly agree*) each. The scale was adapted from video transportation scales previously used with adults viewing brief movie clips (Cherrington et al., 2015; Sestir et al., 2010; Williams et al., 2010). The scale adapted for use in this evaluation defines narrative transportation as absorption into a story and incorporates three underlying constructs related to viewers':

- cognitive engagement (*I was mentally involved in the episode while watching*);
- affective engagement (*The episode affected me emotionally, the technologies in the episode are relevant to my everyday life*)<sup>6</sup>; and
- attentional focus (*While watching the episode I was thinking about things going on around me, I found my mind wandering while watching the episode*).

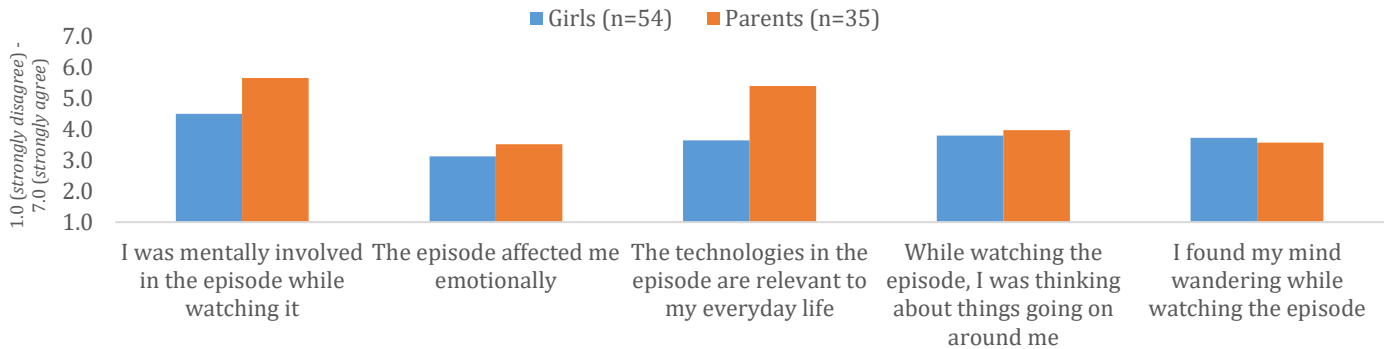
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<sup>5</sup> The evaluation included this set of scales as a first step in piloting it for use in future studies of the *SciGirls* narrative format. The current report provides limited information on the scale's reliability and use in relation to other evaluation questions.

<sup>6</sup> This item was slightly adapted for parents to: *The technologies in the episode are relevant to my daughter's everyday life.*

Based on the transportation indicators participants were asked to rate, the overall episode scale means show that both girls and parents generally experienced a neutral level of narrative transportation from viewing the episode (Girls:  $M = 3.8, SD = 1.04$ ; Parents:  $M = 4.42, SD = .96$ ).<sup>7 8</sup> Figure 6 shows the individual item mean ratings for both groups. Responses for both groups are summarized below the chart.

**Figure 6. Participants' mean ratings of transportation**



**Girls:** Though they shared a range of ratings in each case, as shown in Table 4, the mean ratings indicated that, overall, girls *somewhat agreed* that they were mentally involved in the episode while watching it ( $M = 4.5, SD = 1.72$ ). Overall, they tended to *neither agree nor disagree* that: the technologies in the episode were relevant to their everyday life ( $M = 3.6, SD = 1.98$ ), that they were thinking about things going on around them while watching the episode ( $M = 3.8, SD = 1.95$ ), and that they found their mind wandering while watching ( $M = 3.7, SD = 2.25$ ). They tended to *somewhat disagree* that the episode affected them emotionally ( $M = 3.1, SD = 1.96$ ). In summary, the scale findings indicate that girls were more cognitively and attentionally engaged with the story than emotionally engaged.

**Table 4. Frequency distribution of girls' transportation ratings (n=54)**

	Strongly disagree 1.0	Disagree 2.0	Somewhat disagree 3.0	Neither agree or disagree 4.0	Somewhat agree 5.0	Agree 6.0	Strongly Agree 7.0
I was mentally involved in the episode while watching it	9%	4%	9%	26%	24%	13%	15%
The episode affected me emotionally	28%	20%	13%	13%	7%	13%	6%
The technologies in the episode are relevant to my everyday life	20%	13%	17%	13%	13%	17%	7%
While watching the episode, I was thinking about things going on around me	17%	17%	9%	15%	22%	11%	9%
I found my mind wandering while watching the episode	26%	15%	7%	9%	13%	15%	15%

<sup>7</sup> Although we don't yet have comparison statistics to indicate what constitutes high, moderate, or low levels of transportation, for the purposes of this report we are using the following range: a mean below 3.5 is low transportation, a mean between 3.5 and 4.5 is neutral, and a mean above 4.5 is high transportation.

<sup>8</sup> Cronbach's alpha for this five-item scale in the current evaluation is as follows: Girls  $\alpha = .40, 95\% CI [.10, .62]$ ; Parents  $\alpha = .66, 95\% CI [.44, .81]$ .

**Parents:** Though they shared a range of ratings in each case, as shown in Table 5, overall parents generally *agreed* that they were mentally involved in the episode while watching it ( $M = 5.7, SD = 1.31$ ) and *somewhat agreed* that the technologies in the episode were relevant to their daughters' everyday life ( $M = 5.4, SD = 1.59$ ). Overall, they *neither agreed nor disagreed* that they were thinking about things going on around them while watching the episode ( $M = 4.0, SD = 2.04$ ), and *somewhat disagreed* that they found their mind wandering while watching ( $M = 3.6, SD = 2.03$ ) and that the episode affected them emotionally ( $M = 3.5, SD = 2.27$ ). In summary, the scale findings indicate that, like their daughters, parents were more cognitively and attentionally engaged with the story than emotionally engaged.

	Strongly disagree 1.0	Disagree 2.0	Somewhat disagree 3.0	Neither agree or disagree 4.0	Somewhat agree 5.0	Agree 6.0	Strongly agree 7.0
I was mentally involved in the episode while watching it	0%	3%	6%	6%	26%	29%	31%
The episode affected me emotionally	23%	29%	0%	14%	11%	3%	20%
The technologies in the episode are relevant to my daughter's everyday life	3%	3%	6%	17%	14%	26%	31%
While watching the episode, I was thinking about things going on around me	14%	20%	6%	14%	17%	17%	11%
I found my mind wandering while watching the episode	20%	17%	17%	9%	17%	9%	11%

### 1.4b Participants' ratings of story involvement

Participants were asked for their level of agreement with six statements designed to measure their level of story involvement while watching the episode. Upon locating no age-appropriate scales for story involvement, the evaluation drew on scale statements developed from adults' responses to narrative (Appel et al., 2015; Green & Brock, 2000; Williams et al., 2010). The story involvement scale presents cognitive and affective engagement statements related to the three-part classic narrative structure: story setup, story confrontation, and story resolution. The specific story involvement statements were as follows:

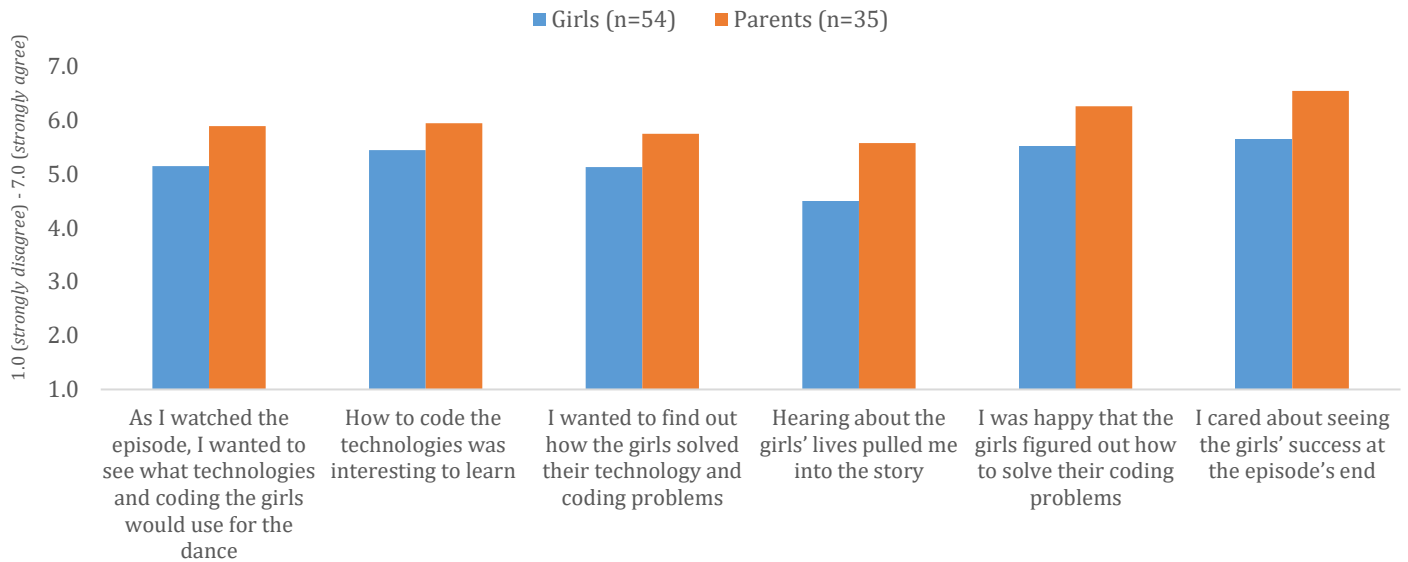
- Cognitive engagement (*As I watched the episode, I wanted to see what technologies and coding the girls would use for the dance; How to code the technologies was interesting to learn; I wanted to find out how the girls solved their technology and coding problems*); and
- Affective engagement (*Hearing about the girls' lives pulled me into the story<sup>9</sup>; I was happy that the girls figured out how to solve their coding problems; I cared about seeing the girls' success at the episode's end*).

Based on the story involvement indicators participants were asked to rate using a scale from 1.0 (*strongly disagree*) to 7.0 (*strongly agree*) each, the overall episode scale means show that participants generally experienced a high level of story involvement from viewing the episode

<sup>9</sup> This item was slightly adapted for parents to: *Hearing about the girls' lives and their families pulled me into the story.*

(Girls:  $M = 5.2, SD = 1.41$ ; Parents:  $M = 6.0, SD = 1.00$ ).<sup>10 11</sup> Figure 7 presents the mean ratings for the individual items for both groups. Responses for both groups are summarized below the chart.

**Figure 7. Participants' mean ratings of story involvement**



**Girls:** Though they shared a range of ratings in each case, as shown in Table 6 on the next page, overall girls tended to *agree* that they cared about seeing the SciGirls' success at the episode's end ( $M = 5.6, SD = 1.78$ ). They *somewhat agreed-to-agreed* that they were happy that the SciGirls figured out how to solve their coding problems ( $M = 5.5, SD = 1.66$ ). Meanwhile they generally *somewhat agreed* that: as they watched the episode they wanted to see what technologies and coding the SciGirls would use for the dance ( $M = 5.1, SD = 1.94$ ), that they wanted to find out how the SciGirls solved their technology and coding problems ( $M = 5.1, SD = 1.78$ ), and that it was interesting to learn how to code the technologies ( $M = 5.4, SD = 1.85$ ). They tended to *neither agree nor disagree-to-somewhat agree* that hearing about the SciGirls' lives pulled them into the story ( $M = 4.5, SD = 1.92$ ). In summary, the scale findings indicate that the girls were both cognitively and emotionally involved in the progress of the storyline but information about the SciGirls' lives had less affective impact.

<sup>10</sup> Although we don't yet have comparison statistics to indicate what constitutes high, moderate, or low levels of story involvement, for the purposes of this report we are using the following range: a mean below 3.5 is low story involvement, a mean between 3.5 and 4.5 is neutral, and a mean above 4.5 is high story involvement.

<sup>11</sup> Cronbach's alpha for this six-item scale in the current evaluation is as follows: Girls  $\alpha = .87, 95\% CI [.80, .91]$ ; Parents  $\alpha = .91, 95\% CI [.86, .95]$ .

**Table 6. Frequency distribution of girls' story involvement (n=54)**

	Strongly disagree 1.0	Disagree 2.0	Somewhat disagree 3.0	Neither agree or disagree 4.0	Somewhat agree 5.0	Agree 6.0	Strongly agree 7.0
As I watched the episode, I wanted to see what technologies and coding the girls would use for the dance	11%	2%	2%	17%	17%	19%	33%
How to code the technologies was interesting to learn	9%	4%	2%	2%	19%	31%	33%
I wanted to find out how the girls solved their technology and coding problems	7%	4%	6%	7%	33%	13%	30%
Hearing about the girls' lives pulled me into the story	13%	4%	9%	20%	20%	15%	19%
I was happy that the girls figured out how to solve their coding problems	6%	2%	2%	13%	19%	22%	37%
I cared about seeing the girls' success at the episode's end	7%	2%	0%	13%	11%	20%	46%

**Parents:** Though they shared a range of ratings in each case, as shown in Table 7, in general parents *agreed* that: they were happy that the SciGirls figured out how to solve their coding problems ( $M = 6.3$ ,  $SD = .98$ ); they cared about seeing the SciGirls' success at the episode's end ( $M = 6.5$ ,  $SD = .85$ ); they wanted to see what technologies and coding the SciGirls would use for the dance ( $M = 5.9$ ,  $SD = 1.10$ ); it was interesting to learn how to code the technologies ( $M = 5.9$ ,  $SD = 1.11$ ); they wanted to find out how the SciGirls solved their technology and coding problems ( $M = 5.7$ ,  $SD = 1.17$ ); and that hearing about the SciGirls' lives pulled them into the story ( $M = 5.6$ ,  $SD = 1.79$ ). In summary, the scale findings indicate that parents were more involved in the storyline than their daughters but, like their daughters, were comparatively less engaged with the presentation about the SciGirls and their families.

**Table 7. Frequency distribution of parents' story involvement (n=35)**

	Strongly disagree 1.0	Disagree 2.0	Somewhat disagree 3.0	Neither agree or disagree 4.0	Somewhat agree 5.0	Agree 6.0	Strongly agree 7.0
As I watched the episode, I wanted to see what technologies and coding the girls would use for the dance	0%	0%	3%	9%	23%	29%	37%
How to code the technologies was interesting to learn	0%	0%	3%	6%	29%	20%	43%
I wanted to find out how the girls solved their technology and coding problems	0%	0%	0%	20%	23%	20%	37%
Hearing about the girls' lives and their families pulled me into the story	6%	3%	6%	6%	20%	14%	46%
I was happy that the girls figured out how to solve their coding problems	0%	0%	0%	9%	11%	26%	54%
I cared about seeing the girls' success at the episode's end	0%	0%	0%	3%	14%	9%	74%

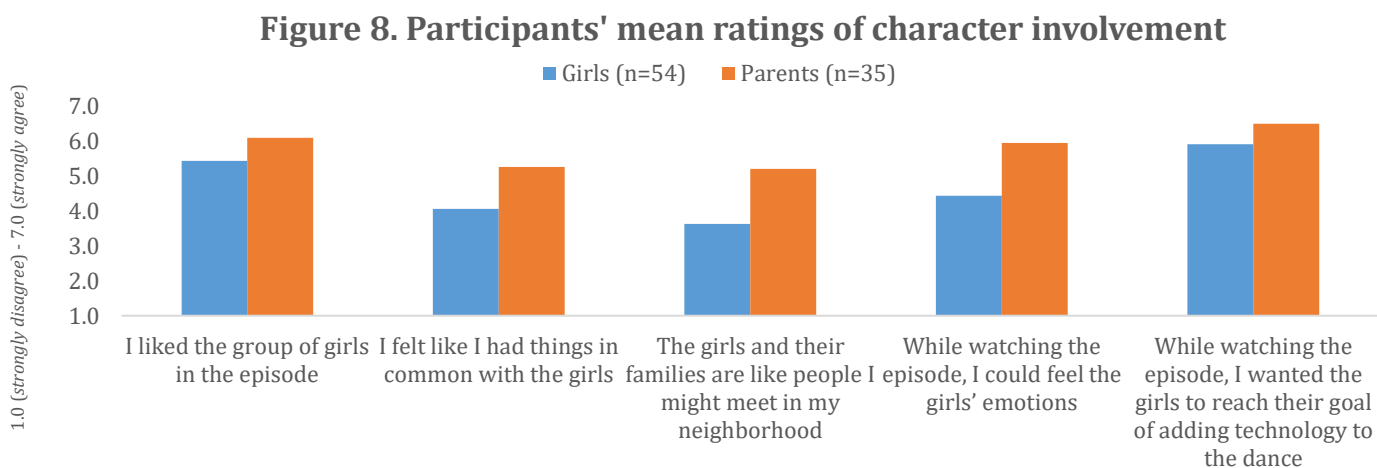
## 1.4c Participants' ratings of character involvement

Girls and their parents were asked for their level of agreement with the five statements designed to measure their level of character involvement while watching the episode. The character identification scale was developed based on dimensions described by Moyer-Guse (2008) and Cohen (2001), including:

- the characters' overall appeal (*I liked the group of girls in the episode*);
- the characters' similarity to themselves (*I felt like I had things in common with the girls<sup>12</sup>; The girls and their families are like people I might meet in my neighborhood*); and
- their identification with the characters in terms of empathy and motivation (*While watching the episode, I could feel the girls' emotions; While watching the episode, I wanted the girls to reach their goal of adding technology to the dance*).

Based on the character involvement indicators viewers were asked to rate using a scale from 1.0 (*strongly disagree*) to 7.0 (*strongly agree*) each, the overall episode scale means show that parents generally experienced a high level of character involvement from the episode, while girls' character involvement was slightly lower (Girls:  $M = 4.7$ ,  $SD = 1.30$ ; Parents:  $M = 5.8$ ,  $SD = 1.15$ ).<sup>13</sup>

<sup>14</sup> Figure 8 presents the mean ratings for the individual items for both groups. Responses for both groups are summarized below the chart.



**Girls:** Though they shared a range of ratings in each case, as shown in Table 8 on the next page, overall the girls generally *agreed* that while watching the episode they wanted the SciGirls to reach their goal of adding technology to the dance ( $M = 5.9$ ,  $SD = 1.61$ ). They tended to *somewhat agree* that they liked the group of SciGirls in the episode ( $M = 5.4$ ,  $SD = 1.83$ ). They tended to *neither agree nor disagree* that while watching the episode, they could feel the SciGirls' emotions ( $M = 4.4$ ,  $SD = 1.89$ ), that they felt like they had things in common with the SciGirls ( $M = 4.1$ ,  $SD =$

<sup>12</sup> This item was slightly adapted for parents to: *I felt like I had things in common with the girls' families*.

<sup>13</sup> Although we don't yet have comparison statistics to indicate what constitutes high, moderate, or low levels of character involvement, for the purposes of this report we are using the following range: a mean below 3.5 is low character involvement, a mean 3.5 to 4.5 is neutral, and a mean above 4.5 is high character involvement.

<sup>14</sup> Cronbach's alpha for this five-item scale in the current evaluation is as follows: Girls  $\alpha = .72$ , 95% CI [.58, .82]; Parents  $\alpha = .83$ , 95% CI [.72, .90].

1.86), and that the SciGirls and their families are like people they might meet in their neighborhood ( $M = 3.6, SD = 2.09$ ). In summary, the scale findings indicate that although the girls liked the SciGirls in the episode, they were more neutral about identifying with them personally.

**Table 8. Frequency distribution of girls' character involvement with the episode (n=54)**

	Strongly disagree 1.0	Disagree 2.0	Somewhat disagree 3.0	Neither agree or disagree 4.0	Somewhat agree 5.0	Agree 6.0	Strongly agree 7.0
I liked the group of girls in the episode	7%	2%	6%	11%	13%	22%	39%
I felt like I had things in common with the girls	19%	4%	7%	24%	24%	15%	7%
The girls and their families are like people I might meet in my neighborhood	26%	7%	15%	17%	11%	13%	11%
While watching the episode, I could feel the girls' emotions	9%	11%	7%	22%	19%	13%	19%
While watching the episode, I wanted the girls to reach their goal of adding technology to the dance	6%	2%	0%	6%	13%	24%	50%

**Parents:** Though they shared a range of ratings in each case, as shown in Table 9, in general parents *agreed-to-strongly agreed* that while watching the episode they wanted the SciGirls to reach their goal of adding technology to the dance ( $M = 6.5, SD = 1.61$ ). They tended to *agree* that they liked the group of SciGirls in the episode ( $M = 6.1, SD = 1.29$ ) and that while watching the episode they could feel the SciGirls' emotions ( $M = 5.9, SD = 1.45$ ). They tended to *somewhat agree* that the SciGirls and their families are like people they might meet in their neighborhood ( $M = 5.2, SD = 1.97$ ) and that they felt like they had things in common with the SciGirls and their families ( $M = 5.3, SD = 1.69$ ). In summary, the scale findings indicated that the parents liked the SciGirls and somewhat identified with the characters personally.

**Table 9. Frequency distribution of parents' character involvement with the episode (n=35)**

	Strongly disagree 1.0	Disagree 2.0	Somewhat disagree 3.0	Neither agree or disagree 4.0	Somewhat agree 5.0	Agree 6.0	Strongly agree 7.0
I liked the group of girls in the episode	0%	3%	3%	6%	14%	20%	54%
I felt like I had things in common with the girls' families.	3%	9%	0%	17%	23%	17%	31%

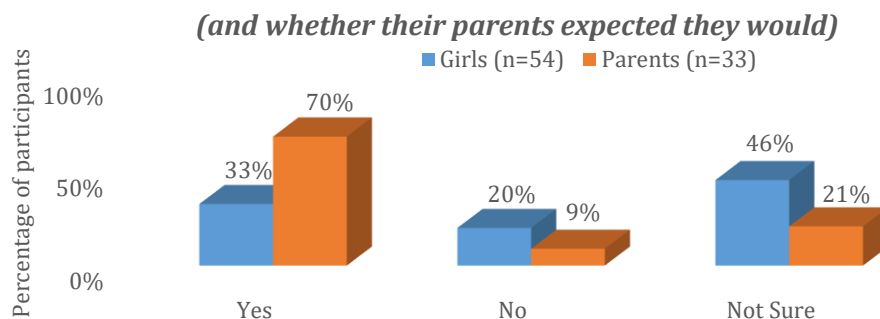


The girls and their families are like people I might meet in my neighborhood	6%	6%	11%	14%	6%	17%	40%
While watching the episode, I could feel the girls' emotions	0%	6%	3%	6%	14%	20%	51%
While watching the episode, I wanted the girls to reach their goal of adding technology to the dance	0%	0%	0%	3%	9%	26%	63%

## 1.5 Whether participants felt the SciGirls are relatable

Participants were informed that when making *SciGirls* episodes the production team aims to show SciGirls that youth can identify with and see as positive role models, and that in the case of the *Digital Dance* episode, the featured SciGirls were Marielly, Marilyn, Sheira, and Nazaret. Girls were then asked: *Thinking about the Digital Dance episode: a) Did you feel you could generally relate to the girls in this episode? Please check one circle below (Yes, No, or Not sure) and explain why you feel this way.* Parents were asked whether they felt their daughters would be able to relate to the SciGirls in the episode. Figure 9 shows the percentages of girls and parents who selected Yes, No, or Not sure in each case.

**Figure 9. Whether girls felt they could relate to the SciGirls featured in the episode**



Responses for both groups are summarized below, followed by examples of their comments, with their feedback presented together.

**Girls:** When the girls were asked if they felt they could generally relate to the SciGirls featured in the episode, the largest group (46%) said they weren't sure, some of whom went on to explain that they didn't have as much exposure to science and technology compared to the SciGirls. About a third (33%) said they could relate to the SciGirls, most often because of shared personal attributes or an interest in science projects. A fifth (20%) of the girls said they could not relate, most often because they did not "do" coding or digital projects, while a few girls noted they don't speak as much Spanish as the SciGirls did in the episode.

**Parents:** From the parents' perspective, seven-tenths (70%) thought their daughters would be able to relate to the SciGirls, in some cases because they said their daughters like science and

technology, and in other cases because they thought their daughters were similarly creative or curious. A tenth (9%) said they didn't think their daughters could relate and one-fifth (21%) said they weren't sure. These parents tended to observe that their daughters: weren't interested in technology, don't typically speak Spanish among their friends, are younger or less mature than the SciGirls, and were from different countries than the episode featured.

#### **Yes can relate**

- *Girl: Because we could know that they were talking in Spanish and English*
- *Girl: Even though I do not code, I share the same characteristics with the girls such as persistence and the mentality that these girls share.*
- *Girl: I really like to make everything perfect and for everything to go right.*
- *Girl: In school, we do coding and its really fun and I like seeing them work together.*
- *Girl: The girls were all of Hispanic/Latino descent and were breaking barriers because typically you don't see girls doing things like coding, and it is even more rare to see a woman of Hispanic descent to do so.*
- *Parent: Because she is a very creative person*
- *Parent: Because since they're Hispanic, they can do anything if they try. I enjoyed their humbleness and effort.*
- *Parent: My child likes to create things and this how's her that creating is important.*
- *Parent: My daughter is interested in technology and may ignite an interest or a future career that she never knew existed.*
- *Parent: One of my daughters takes coding in school and hopefully will be able to apply what she is learning in a project.*
- *Parent: She loves dancing and this episode might have interested her in technology.*

#### **No, can't relate**

- *Girl: I do not talk in Spanish like that*
- *Girl: I don't really know how to do coding and computer stuff.*
- *Girl: They are older than I am.*
- *Parent: Too old*
- *Parent: She does not like technology.*

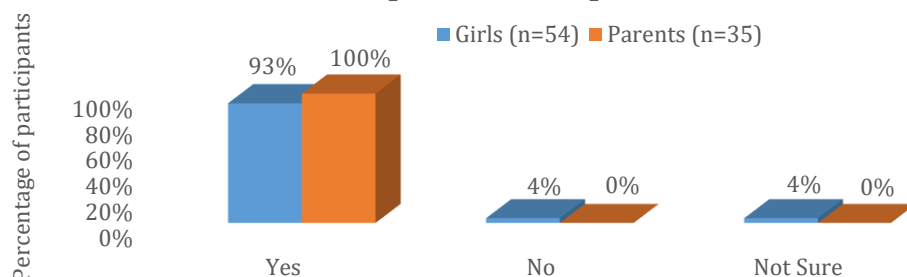
#### **Not sure**

- *Girl: I didn't know much about coding/computer science.*
- *Girl: I don't really do coding at school, I've only done it twice.*
- *Girl: I think coding is really cool, but I never have considered it.*
- *Girl: I wasn't completely sure what they were saying, but I could relate a little to what they like to do (volleyball).*
- *Parent: My daughter likes art more than technology*
- *Parent: She's not interested in the use of applications and technology.*
- *Parent: My daughter doesn't speak nor understand Spanish that well. And they are much older than her "8"*
- *Parent: These girls had a Mexican/Central American vibe and most of the Latins we know are from Cuba or South America. Maybe this is an economic difference. Couldn't quite put my finger on it.*
- *Parent: They don't speak Spanish among their friends. They speak it to family and relatives.*

## 1.6 Whether participants felt the SciGirls are good role models

Following from the previous question about relatability in section 1.5, girls were then asked if they felt the SciGirls featured in the episode were positive role models for them or other Hispanic girls, while parents were asked if they thought the SciGirls were positive role models for their daughters or other Hispanic girls. As shown in Figure 10, while there were some differences of opinion about the SciGirls' relatability as noted in section 1.5, in this case nearly all (93%) the girls and all the parents (100%) thought the SciGirls were positive role models for Hispanic girls.

**Figure 10. Whether participants felt that the SciGirls featured in the episode were positive role models**



When invited to comment on their ratings, most of the girls and parents chose to do so, all of whom praised the SciGirls. The girls frequently commented that they felt the SciGirls were *smart, interesting, positive, nice, hardworking*, and did *cool stuff*. Parents frequently described the SciGirls as *smart, hardworking, mature, focused, family-oriented*, and *involved in their community*. A sampling of their comments about the SciGirls as role models is below, with feedback from both groups presented together. None of the participants who selected *No* or *Not sure* chose to elaborate.

### **Yes, they are good role models**

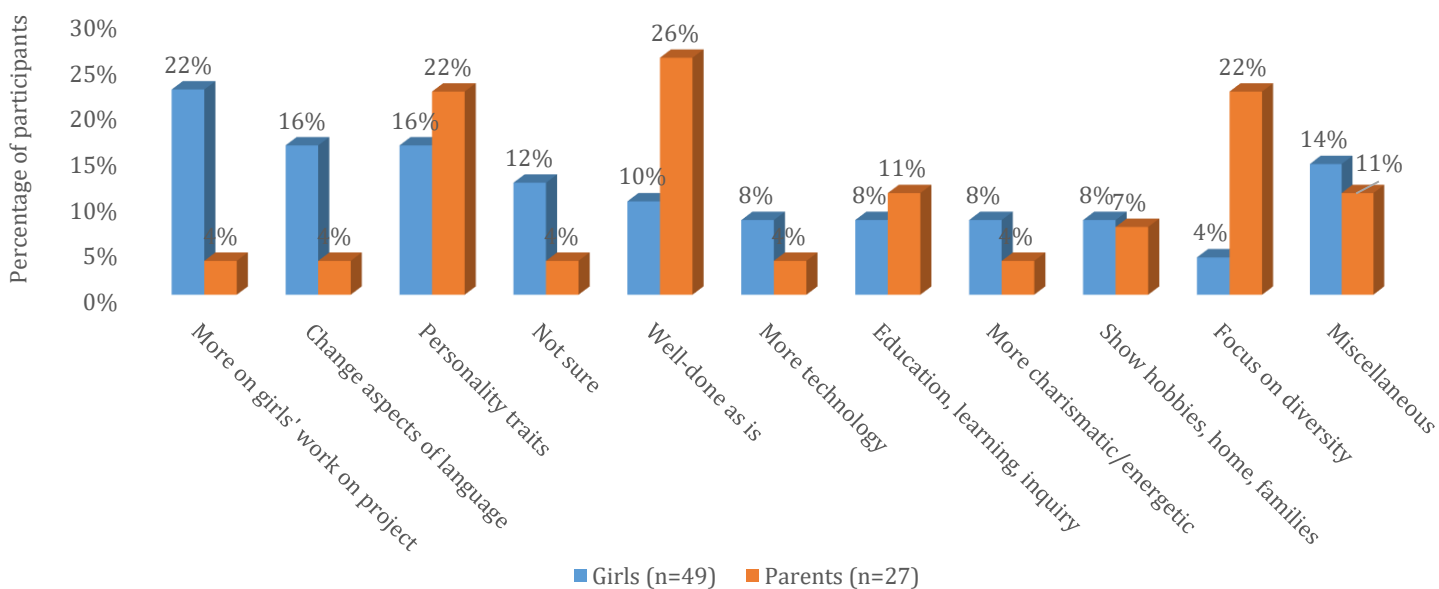
- *Girl: Even if it didn't work the first time they kept a positive attitude and went along.*
- *Girl: I feel as if they're setting an example of what you can do even if you have less and even if you're a teen.*
- *Girl: I think because they're everyday girls doing things that involves thinking and creativity.*
- *Girl: It is always important to do something you love. These girls had a passion for coding.*
- *Girl: It shows other Hispanic girls that anyone can accomplish anything even if someone bullies or teases you for being Hispanic.*
- *Girl: They act nice and are not mean to each other*
- *Girl: They are very smart and very interesting.*
- *Girl: They did cool stuff*
- *Girl: They inspired me and can inspire other girls too*
- *Girl: They never gave up they just kept going.*
- *Girl: They were always upbeat - even if something went wrong. They would always high-5 or laugh. It made it entertaining.*
- *Girl: They were being positive and were all good at coding, and knew all about technology.*
- *Girl: They were bilingual, interested in computers, educated and overall very nice.*
- *Girl: They worked very hard.*
- *Parent: 100% these girls seem to come from humble background, but that has not stopped them for being confident.*
- *Parent: Empowers you to go ahead and try something new. Even if you were scare, you must try.*
- *Parent: For her perseverance and even though it's hard, you can work in a group.*
- *Parent: I enjoyed how they were so simple. It was interesting and they had nice attitudes. Very inspiring video.*
- *Parent: It gives the assurance that Latin origin girls have a future in this country.*
- *Parent: They show that working together has power and working in a team is a good way to achieve goals*

- Parent: The families and they came from other countries and are inspiration for other children who can accomplish many things.
- Parent: They are Latinos like her who have interest to continue studying and get ahead.
- Parent: They are very mature and are involved in the community.
- Parent: They make an impact in the community.
- Parent: They show leadership and the desire to succeed.
- Parent: They showed girls as family-oriented.
- Parent: They were smart, hard-working and worked together to accomplish their goals.
- Parent: They worked well as a team and didn't get rattled when it didn't go so well.

## 1.6a Participants' suggestions for how to feature SciGirls as role models

Girls were asked what the production team could do in the future to ensure that the SciGirls they include are the best possible role models, while parents were asked to offer suggestions for including the best role models for their daughters and their daughters' friends. Figure 11 presents the types of responses shared by both groups.

**Figure 11. Participants' suggestions for how to feature SciGirls as role models**



Responses from girls and parents are summarized below, followed by examples of their specific comments, with feedback from both groups presented together.

**Girls:** Among the 49 girls who shared a response, more than a fifth (22%) suggested providing more information about the SciGirls' work on the project. More than a tenth each thought the production team should change aspects of the language (16%), suggested producers look for SciGirls with specific personality traits (16%), or said they were not sure (12%). A tenth (10%) of the girls thought this was well-done as is. Less than a tenth each suggested including more about technology (8%), remarked on education/learning/inquiry (8%), thought the SciGirls should be more charismatic or energetic (8%), suggested the episode show their hobbies, home, and families (8%), or thought the producers should focus on diversity (4%), specifically in the age of SciGirls featured in the episode. More than a tenth (14%) shared miscellaneous comments.

**Parents:** Among the 27 parents who shared a response, the largest group, more than a quarter (26%), thought this aspect of the episode was well-done. More than one-fifth each suggested specific personality traits (22%) or recommended a focus on diversity (22%). More than a tenth each suggested a focus on education/learning/inquiry (11%) or shared miscellaneous comments (11%). Smaller groups of less than one-tenth each suggested showing the SciGirls' hobbies, homes, and families (7%), providing more information about their work on the project (4%), changing aspects of the language (4%), including more information about technology (4%), selecting more charismatic/energetic SciGirls (4%), or said they were not sure (4%).

#### **More about SciGirls' work on the project**

- *Girl: I want to hear why they chose this activity. It would be more relatable.*
- *Girl: They can show more parts where they struggled so they know that it's not easy but show more parts where they are happy and having fun when they get their task accomplished.*
- *Girl: I want to see them leading people because no matter how small you are you can always become a strong leader.*
- *Parent: Maybe explaining a bit more about how they do the coding would make them look more like role models.*

#### **Change an aspect of the language**

- *Girl: They can make this in English so other girls can see it.*
- *Girl: They can also have the girls speak in both Spanish and English.*
- *Girl: ...they didn't talk Spanish that well...*
- *Parent: ... speak real Spanish in the episode.*

#### **Look for SciGirls with specific personality traits**

- *Girl: Funny, polite...*
- *Girl: I think the girls need to be confident, hardworking and persistent!!*
- *Girl: They can make sure by trying to find girls who are sweet and positive. I would want to see girls who are nice, sweet and talented.*
- *Parent: ...nice, respectful person, creative, unique.*
- *Parent: ...responsible and very intelligent*
- *Parent: I liked it but I saw a girl with a bit of sarcasm which I didn't enjoy. I think if they fixed that it would be okay.*

#### **Well-done as is**

- *Girl: I think they did a good job.*
- *Parent: I think they did accomplish this well, great job!*
- *Parent: Everything was perfect. Everything was very inspiring.*

#### **More about technology**

- *Girl: I would like to see them make so many things with technology because I can also learn about it.*
- *Girl: I would like them to show more electronics because then the people would be more interested in the program.*
- *Parent: Maybe explaining a bit more about how they do the coding...*

#### **Focus on education, learning, inquiry**

- *Girl: Make sure that the girls are educated...and are interested in the topic of the program...*
- *Girl: You/they can give suggestions for trying new things and ideas*
- *Parent: Good student...*
- *Parent: Positive questions*

#### **Look for SciGirls who are more charismatic/energetic**

- *Girl: I think the production team should tell the girls to show emotions...*
- *Girl: More energetic because they didn't talk Spanish that well and also because they were like "this is my house" which exclamation points because they are not energetic.*
- *Parent: Charisma*

#### **Show the SciGirls' hobbies, homes, families**

- *Girl: The production team can make sure the girls have the same interests as normal teens do.*
- *Girl: Make sure that the girls...are interested in the topic of the program, but also have other hobbies and interests.*
- *Parent: Maybe show what they do on weekends for fun. How they interact with siblings.*

**Focus on diversity**

- Girl: They can put girls that are younger, because I feel I would have related better.
- Girl: ...I also enjoyed the diversity between the girls, they represented the Hispanic/Latino culture well. I'd also want to see older girls outside of high school.
- Parent: I would like the girls being from different social classes and different backgrounds.
- Parent: Continue to find girls with similar personalities, but different cultural backgrounds.
- Parent: I would like to see different countries represented and include elementary, middle and high school. I would like to see success stories of girls that began at school and continued into college and possibly follow them into what Universities they go to and what are they doing in the STEM field.

**Miscellaneous**

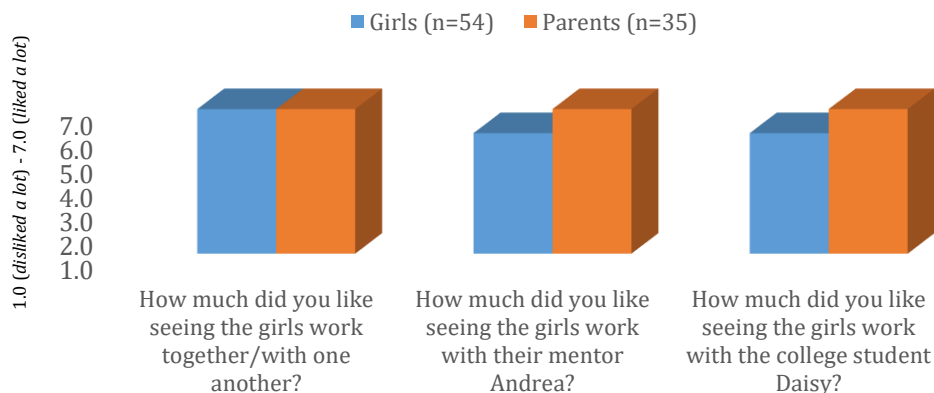
- Girl: The Production Team should help make sure the girls they include in this program by asking them questions.
- Girl: I would like if they dance. That will be so much funner (heart shape)
- Parent: It would be good to show like a "before" and "after" of the girls' lives

## 1.7 How much participants liked seeing the SciGirls work together and with mentors

Participants were informed that each *SciGirls* episode features SciGirls interacting with each other and with STEM professional women mentors, as shown in the picture from *Digital Dance*, to the right. They were then asked to rate how much they liked seeing the SciGirls work together, how much they liked seeing the SciGirls work with their mentor Andrea, and how much they liked seeing the SciGirls work with the college student Daisy. For each question, they were asked to circle one number from 1.0 (*disliked a lot*) to 7.0 (*liked a lot*), with 4.0 being neutral. Figure 12 compares the median ratings for both the girls and their parents across all three questions. The findings for each respective question are presented under 1.7a – 1.7d, along with additional feedback given about the SciGirls-mentor relationship.



**Figure 12. Median ratings of how much participants liked seeing the SciGirls work with one another and their mentors**



## 1.7a How much participants liked seeing the SciGirls work together

When asked how much they liked seeing the SciGirls work together on a scale from 1.0 (*disliked a lot*) to 7.0 (*liked a lot*), both the girls and the parents generally indicated that they liked seeing this *a lot* ( $Mdn = 7.0$ ). Throughout their surveys, participants shared an appreciation for seeing the SciGirls collaborate, bring their individual ideas to the project, and strengthen the dance through teamwork. In the face of conflict/disagreement, a number of girls also pointed to the importance of the SciGirls' friendships. At the same time, a few of the girls thought the challenges faced by the SciGirls could have been more strongly emphasized in the episode, and a couple thought the SciGirls seemed to be afraid of making mistakes. A sampling of the participants' comments on these themes is shared below. For example:

### **Appreciation for seeing the SciGirls collaborate**

- *Girl: I think it was great that they focused on each other skills.*
- *Girl: I liked how they all had different ideas.*
- *Girl: Because they could share each other's ideas*
- *Girl: I loved how they worked in partners then in a group.*
- *Girl: The girls seemed as if they're really good friends.*
- *Parent: The more they work together the better the results.*
- *Parent: They collaborated in a way that each girls' idea was respected.*

### **Importance of friendships and positive attitudes**

- *Girl: How they are all good friends. I liked the part where everything was going wrong.*
- *Girl: Like I said before I like how they work in teams and they didn't argue. They all seemed very nice and had a positive attitude.*
- *Girl: [I could relate to the girls because] they were stressed that some things didn't work.*
- *Girl: Even if it didn't work the first time they kept a positive attitude and went along.*
- *Girl: They were always upbeat - even if something went wrong. They would always hi-5 or laugh. It made it entertaining.*
- *Girl: They never gave up they just kept going.*

### **Importance of showing challenges**

- *Girl: Could have shown more of the struggle.*
- *Girl: They can show more parts where they struggled so they know that it's not easy but show more parts where they are happy and having fun when they get their task accomplished.*
- *Girl: The girls did a great job of working together, but I feel as if they were afraid of making mistakes and therefore did not try a variety of ideas.*
- *Girl: I think they should have practiced more on the nervous characteristics because they were afraid of their own work.*

## 1.7b How much participants liked seeing the SciGirls work with Andrea

When asked how much they liked seeing the SciGirls work with their mentor Andrea on a scale from 1.0 (*disliked a lot*) to 7.0 (*liked a lot*), the girls indicated that they *liked* these interactions ( $Mdn = 6.0$ ), while the parents liked them *a lot* ( $Mdn = 7.0$ ). Some of the participants commented on what viewers could learn from these interactions, while others thought Andrea could have had a larger presence in the episode. For example:

- *Girl: I liked seeing the girls working with their mentor Andrea because when they work together you can learn better from them.*
- *Girl: I think it was interesting or how much they enjoyed her presence.*
- *Parent: You can see they looked up to her and that she's a great role model.*
- *Parent: The experience of Andrea, its fundamental to the girls.*

- *Girl: I liked it but I think SciGirls should work more with Andrea.*
- *Girl: I wanted to learn more about the girl's teachers.*
- *Girl: More on the mentors.*
- *Parent: I'd like to see this relationship develop more.*
- *Parent: I would have liked to see her teaching and the kids interacting in class.*
- *Parent: She could have been a little more involved.*
- *Parent: Should focus more on interaction with mentors.*

### **1.7c How much participants liked seeing the SciGirls work with Daisy**

When asked how much they liked seeing the SciGirls work with their mentor Daisy on a scale from 1.0 (*disliked a lot*) to 7.0 (*liked a lot*), here again, the girls generally indicated that they *liked* these interactions (*Mdn* = 6.0), while the parents liked them *a lot* (*Mdn* = 7.0). Some girls and parents went on to explain that they thought Daisy was a good role model, while others indicated this relationship could have been developed further. For example:

- *Girl: She's really good, so they can get help from her.*
- *Girl: I think it was cool that different age groups worked together.*
- *Parent: Good chemistry.*
- *Parent: I thought the mentors were much better role model for my daughter than the girls.*
- *Girl: The reason why I gave the question that rating is because I didn't see the girls working with Daisy that much.*
- *Girl: I liked it a lot, but what exactly was her relation with them?*
- *Girl: I thought Daisy was also a great mentor but I also would have liked to hear her background story and how she got into coding.*
- *Girl: I honestly do not even remember that happening. Who is Daisy?*
- *Parent: It was a very short segment.*

### **1.7d Additional feedback participants gave about the SciGirls-mentor relationship**

As will be presented in Section 1.11a, when participants were asked how good a job the episode did in showing the SciGirls connect with their role models and mentors on a scale from 1.0 (*poor job*) to 5.0 (*excellent job*), overall the girls indicated the episode did a *good job* (*Mdn* = 4.0) while the parents indicated the episode did an *excellent job* (*Mdn* = 5.0) in this regard. Some of the girls suggested showing a stronger connection between the SciGirls and their mentors by having the SciGirls ask more questions of their mentors, as shared below:

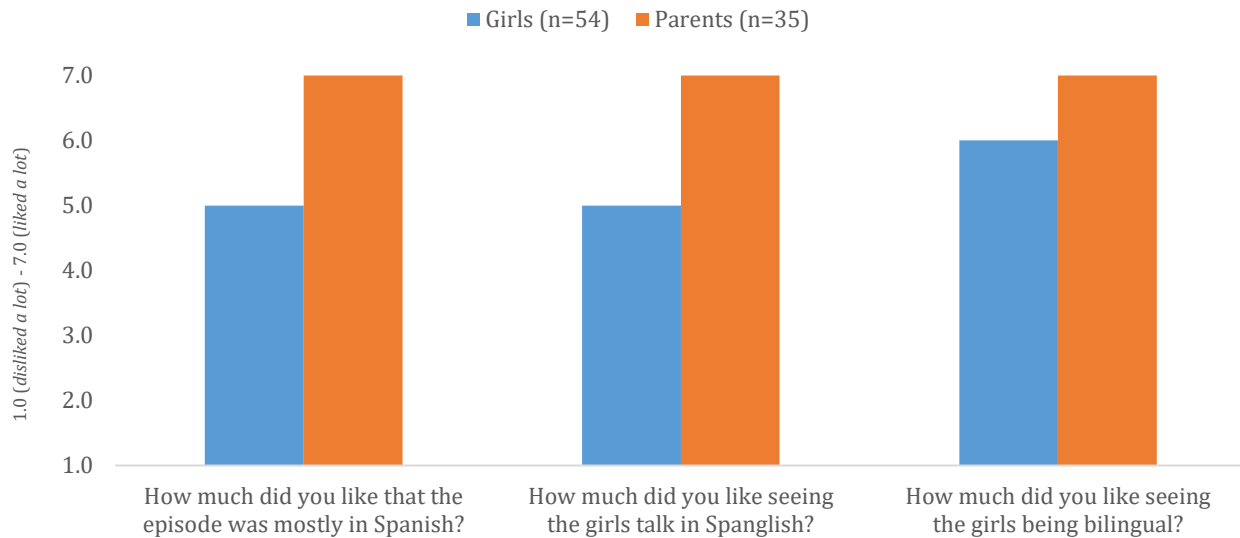
- *Girl: They could have shown or asked more question to the adults.*
- *Girl: I think that they should show more of the teachers and them asking questions*
- *Girl: The episode was great but one thing they could do is ask more questions if they need.*



## 1.8 How participants felt about the episode's use of Spanish, Spanglish, and English

Participants were asked to rate how much they liked the way the episode used Spanish, Spanglish, and bilingualism, using a scale from 1.0 (*disliked a lot*) to 7.0 (*liked a lot*), with 4.0 being neutral in each case. Figure 13 shows the median ratings for both girls and parents.

**Figure 13. Median ratings of how much participants liked or disliked the episode's use of Spanish, Spanglish, and bilingualism**



The findings for each question are presented under 1.8a – 1.8c.

### 1.8a How much participants liked that the episode was mostly in Spanish

When asked to rate how much they liked seeing the episode in Spanish on a scale from 1.0 (*disliked a lot*) to 7.0 (*liked a lot*) with 4.0 being neutral, participants generally indicated they liked this aspect of the episode, though the parents tended to rate it somewhat higher than did the girls (*Mdn* = 7.0 vs. 5.0). The frequency distribution of their ratings is shared in Table 10.

	Disliked a lot	1.0	2.0	3.0	4.0	5.0	6.0	7.0	Liked a lot
Girls (n=54)		9%	3%	9%	9%	3%	11%	57%	
Parents (n=35)		17%	9%	4%	17%	7%	24%	22%	

When explaining their ratings, both the girls and parents pointed to various reasons why they liked or, in some cases, disliked seeing the episode in Spanish, as outlined on the following page.

## ***Reasons for liking seeing the episode in Spanish***

Those who liked seeing the episode in Spanish gave various reasons, including, for example, that the episode's use of Spanish made it accessible to Spanish speakers, particularly parents who otherwise might not be able to co-view with their daughters. Other participants, particularly girls who indicated they were more fluent in English or parents who observed this to be the case, remarked that the option of seeing the episode in Spanish could help the girls learn more Spanish, in addition to simultaneously exposing them to coding and computer science. Finally, some participants, most often parents, liked the idea that incorporating Spanish reinforced the girls' Hispanic heritage. Examples of participants' comments on each theme are shared below, with feedback from both groups presented together.

### **Makes the episode accessible to Spanish speakers**

- *Girl: I liked it a lot because my whole family could understand it.*
- *Girl: I liked it because I speak the language and it made me feel part of it.*
- *Girl: I liked it because it is my language and I like it.*
- *Girl: I liked that the episode was in Spanish because some kids do not understand English and now they can understand every word.*
- *Parent: I feel that will give my child more security to see that other girls speak Spanish like her.*
- *Parent: I felt very comfortable that it was in my language for a better understanding.*

### **Helps me/my daughter learn Spanish**

- *Girl: I liked it because not only are people learning about science but also some Spanish.*
- *Girl: I need to practice more Spanish.*
- *Girl: I am fluent in Spanish and I want to learn more every day. This video was clear and I enjoyed it very much.*
- *Girl: I am bilingual but I normally speak English in the house. Hearing the episode expanded my vocabulary.*
- *Girl: My rating is 6 because kids that are Hispanic should learn Spanish*
- *Parent: My kids need to keep practicing Spanish, speaking mostly English I want them to watch Spanish shows.*

### **Reinforces Latina heritage**

- *Parent: I come from a Latin country and I will like my child to watch this program and learn Spanish at the same time.*
- *Parent: I like it because [you] do not forget that they are Latina.*

## ***Reasons for not liking seeing the episode in Spanish***

While few participants directly stated that they disliked the idea of seeing the episode in Spanish per se, many participants raised issues with *how* the Spanish was spoken in *Digital Dance*. Most often these participants described the Spanish as *hard to follow* because the featured SciGirls in the episode mispronounced words, used made-up words, mumbled in places, or were otherwise hard to understand. The girls tended to raise these issues more than their parents, most often elaborating that although they considered themselves bilingual, they personally felt more *comfortable* with English, noting that English was their *first language* or that it was more *relatable*, and as such they may have been more easily thrown off or confused by the featured SciGirls' errors. Some parents also indicated a preference for English. While they tended to raise similar issues to those pointed out by their daughters, a few parents further reflected on their own experience of moving to the U.S. and having a strong conviction to learn English, and to provide opportunities for their children to do the same and use English consistently.

Several participants, both girls and parents, suggested that the use of subtitles would help address the issue of wanting to see more English in the episode, while also helping those who may have

trouble understanding the Spanish. Additionally, beyond what surfaced in these survey responses, the subtitle suggestion was frequently offered across the discussion sessions.

Finally, at least a few participants qualified that if the episode is to be filmed in Spanish, then the SciGirls should use *correct* or *proper* Spanish. None of the participants appear to have raised the issue of the type of Spanish spoken in terms of country of origin and/or how this factor might have played a role in their comprehension of or preference for the use of Spanish in the episode. A sampling of the participants' comments on these themes follows below, with feedback from girls and parents presented together.

**The Spanish was hard to follow**

- *Girl: I almost understood nothing. Again, you need English Subtitles, please.*
- *Girl: I enjoyed the episode being in Spanish, however the girls' Spanish was at times difficult to follow.*
- *Girl: Because some words they used I didn't understand*

**Would have preferred more English**

- *Girl: I kind of didn't like that the episode was mostly in Spanish because I want to give other people a chance to understand what the girls were doing.*
- *Girl: I feel like most kids would enjoy it but most Hispanic kids are learning English and would relate more if it had more English.*
- *Girl; Because I speak more English*
- *Girl: I would rather it in English.*
- *Girl: I liked it, but at the same time I didn't because I understand English better.*
- *Parent: I think it was interesting, but would have preferred it to be in English.*
- *Parent: I think you can keep English speaking girls more focused with more English.*
- *Parent: I feel English is our first language and Spanish should be the subtitle.*
- *Parent: I could relate to it but some audiences may feel more comfortable with English.*
- *Parent: English is the language of the country here and is something I want my children to use and get better at.*

**If in Spanish, speak correct Spanish**

- *Girl: Liked seeing in Spanish but the girls Spanish was difficult to follow*
- *Girl: Because if the episode was in Spanish they should talk really good Spanish.*
- *Parent: They need to talk 100% Spanish and correctly.*

**1.8b How much participants liked seeing the SciGirls talk in Spanglish**

When asked to rate how much they liked seeing the SciGirls talk in Spanglish on a scale from 1.0 (*disliked a lot*) to 7.0 (*liked a lot*) with 4.0 being neutral, participants generally indicated they liked this aspect of the episode, although parents tended to rate this aspect somewhat higher than did the girls (*Mdn* = 7.0 vs. 5.0). The frequency distribution of their ratings is shared in Table 11.

Table 11. Frequency distribution of how much participants liked seeing the SciGirls talk in Spanglish									
	Disliked a lot	1.0	2.0	3.0	4.0	5.0	6.0	7.0	Liked a lot
Girls (n=54)		17%	0%	7%	13%	19%	19%	26%	
Parents (n=35)		9%	3%	6%	3%	9%	17%	54%	

When explaining their ratings, both the girls and parents pointed to various reasons why they liked or, in some cases, disliked seeing the episode in Spanglish, as outlined below.

### ***Reasons for liking seeing the episode in Spanglish***

Those who liked seeing the episode in Spanglish shared two main explanation: that the use of Spanglish was *relatable* and *common* and/or that it made the Spanish easier to understand. A few participants, mostly girls, commented that it was *interesting*, *fun*, *nice*, or *good* to see the SciGirls using Spanglish. Examples of participants' comments on each theme are shared below:

#### **That's how I talk/relatable**

- *Girl: Because some girls like me talk Spanglish*
- *Girl: Girls that speak Spanglish understand as well*
- *Girl: I also speak it a lot with my family so it was normal*
- *Girl: I always speak Spanish because sometimes I forget Spanish words and just say them in English and it is relatable.*
- *Girl: I did because it showed me that they know both.*
- *Girl: I got to see both languages I know.*
- *Girl: It is common for bilingual people to talk in Spanglish, so this didn't affect me.*
- *Parent: Because it is very good that they are bilingual girls.*
- *Parent: I felt a strong connection because I grew up speaking English, Spanish and Spanglish.*
- *Parent: I like the combination of the two languages*
- *Parent: More natural to interchange between English and Spanish.*

#### **Could understand/helped with the Spanish**

- *Girl: It allowed me to understand more.*
- *Girl: It was helpful because when I didn't understand a Spanish word, an English one would pop up. It really did help.*
- *Girl: I'm better speaking Spanglish than just English or just Spanish.*

#### **Interesting/good/fun/nice**

- *Girl: It was interesting to see how the girls switched from Spanish to English while talking to each other.*
- *Girl: Well, isn't English the main language for kid's entertainment? Also, Spanglish is good.*
- *Girl: I liked it. It was a good balance*
- *Parent: I liked it a lot.*

### ***Reasons for not liking seeing the episode in Spanglish***

Several participants indicated they didn't like the use of Spanglish because they had trouble following the SciGirls' use of Spanglish as they mixed words or didn't use words they understood. Several participants, primarily girls, disliked that the use of Spanglish still involved the use of Spanish, with a couple adding that they would have preferred the episode use English only. Others, however, primarily parents, noted that they would have preferred the episode use solely Spanish and not mix languages, with a couple observing that the program is for Latino audiences and Spanish is part of their heritage. A sampling of the participants' comments on these themes is below, with feedback from both groups presented together.

#### **Couldn't follow**

- *Girl: Because I didn't know what they were saying*
- *Girl: I did not like that the girls were speaking Spanglish because it is confusing to understand.*
- *Girl: I kind of like it but they have to fix the grammar.*
- *Parent: Because it is more confusing*
- *Parent: I believe that most of them had a hard time speaking Spanish.*

**Would prefer English, no Spanish**

- Girl: I did not like it because it was in Spanish.
- Girl: I didn't like that because it should be Spanish or English alone, not Spanglish.
- Girl: I like programs in English more
- Parent: I would have preferred it to be in English.

**Would prefer Spanish only**

- Girl: I wish it would emphasize a little bit more in Spanish.
- Parent: I do not like it because they are focusing on Latinos
- Parent: I feel that will give my child more security to see that other girls speak Spanish like her.
- Parent: I feel they shouldn't abandon their heritage.
- Parent: If it's Spanish it should be all in Spanish.

**1.8c How much participants liked seeing the SciGirls being bilingual**

When asked to rate how much they liked seeing the SciGirls being bilingual on a scale from 1.0 (*disliked a lot*) to 7.0 (*liked a lot*) with 4.0 being neutral, overall, the parents tended to rate the episode's use of bilingualism somewhat higher (*Mdn* = 7.0) than did the girls (*Mdn* = 6.0), yet both were still very positive in this regard. Table 12 shows the frequency distribution of their ratings.

Table 12. Frequency distribution of how much participants liked seeing the SciGirls being bilingual									
	Disliked a lot	1.0	2.0	3.0	4.0	5.0	6.0	7.0	Liked a lot
Girls (n=54)		6%	2%	2%	19%	13%	11%	48%	
Parents (n=35)		0%	0%	6%	3%	3%	11%	77%	

When explaining their ratings, both the girls and parents pointed to various reasons why they liked or, in some cases, disliked the episode's use of bilingualism, as outlined below.

***Reasons for liking the use of bilingualism***

Participants offered many reasons for liking the episode's use of bilingualism. Most often they pointed to the ideas that the SciGirls' bilingual speaking was *relatable*, *interesting*, *cool*, and/or an *asset* or *door-opener*. Some participants observed that the bilingualism was an opportunity to highlight Hispanic culture, while others noted that it made the program accessible to both English and Spanish speakers or to those learning one of the two languages. A sampling of the girls' and parents' comments on these themes is below.

**Relatable**

- Girl: I loved it, I feel it gives other bilingual girls a sense of pride to know that there are other girls like them, girls who can do cool things like coding.
- Girl: I loved it because my mom could understand and watch it with us
- Girl: It was cool seeing bilingual Latino girls in the film. Which is usually not common.
- Girl: I'm bilingual, I believe that this will give them more opportunities because they can speak about technology to English and Spanish children/adults.
- Girl: I rate it a 7 because the girls were bilingual and I was able to understand.

- *Girl: I liked it because I talk both languages.*
- *Girl: I liked that they're bilingual because some television shows that are usually on aren't in Spanish and English.*
- *Girl: People should be bilingual, that way you can achieve a lot of goals.*
- *Parent: I don't believe kids speak in only one language to each other. They interchange between Spanish and English. It would have made it more believable and natural.*

### **Being bilingual is an asset/door opener**

- *Girl: Most people should be bilingual*
- *Girl: I liked it. I think it's important to be bilingual.*
- *Parent: Very nice to be bilingual. I think it opens many other doors in you are a bilingual person.*
- *Parent: Bilingual is an asset and something we can relate to.*
- *Parent: Being bilingual is important these days in this work environment.*
- *Parent: It's nice that the girls can communicate in two languages*
- *Parent: I love to see the girls born in this country use two language because it opens more doors in their lives*
- *Parent: I felt it was a good reinforcement so that my girls see the importance of friends being multi-lingual. My girls know the importance. They always tell me to speak to them in Spanish*

### **Highlights Hispanic culture**

- *Girl: The girls didn't lose their culture.*
- *Girl: I liked it a lot that the girls were bilingual because now they might feel good inside that they can help kids that don't know English learn*
- *Girl: Because they should show that they are Hispanic and proud of it.*

### **It's good/interesting/cool to be bilingual**

- *Girl: It shows that they are being taught both languages.*
- *Girl: I thought it was interesting to see how they communicated.*
- *Girl: Being bilingual is really cool and useful.*
- *Girl: Being Bilingual is cool.*

### **Makes it accessible to both English and Spanish speakers or those learning**

- *Girl: Because I need to practice more Spanish.*
- *Girl: I liked it because everyone who doesn't speak Spanish they can translate it*

### **Reasons for not liking the use of bilingualism**

Participants who *didn't* like something about the SciGirls being bilingual tended to focus on their having difficulty understanding the SciGirls, noting that the girls mispronounced words, used made up words, or used poor grammar. Less often the participants, more often parents, commented that they would prefer to see the episode focus on one language, without mixing. A sampling of the girls' and parents' comments on these themes follows below.

### **Couldn't understand**

- *Girl: I didn't like how the girls were being bilingual because I couldn't understand a lot about what they were talking about because it was confusing.*
- *Parent: Because it is confusing*

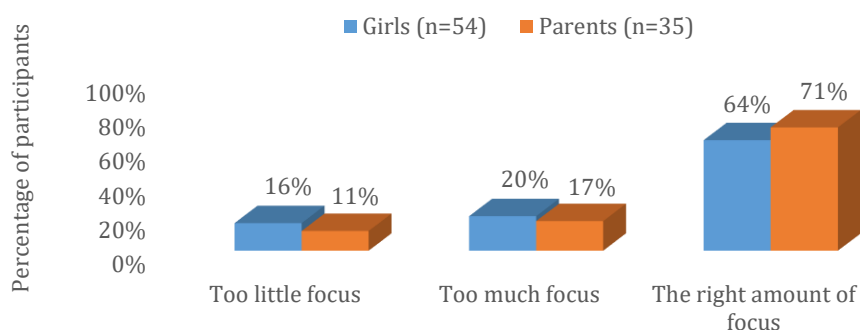
### **Prefer one language/not mixing languages**

- *Parent: I believe that we shouldn't mix languages. Speaking Spanglish is not appropriate.*
- *Parent: Again, I think most of the girls had a hard time speaking in Spanish.*
- *Parent: Would have preferred more English.*
- *Parent: Kids should know how to speak their native language.*
- *Parent: I would like more in one language.*

## 1.9 How participants felt about the episode's focus on the SciGirls' Hispanic cultural background

Participants were asked to reflect on the episode's focus on the SciGirls' Hispanic culture, and whether they felt there was too little focus, too much focus, or just the right amount. As shown in Figure 14, about two-thirds (64%) of the girls thought the episode's focus on the SciGirls' Hispanic cultural background was about right, while a fifth (20%) thought there was too much focus and less than a fifth (16%) thought there was too little focus. From the parents' perspective, not quite three-quarters (71%) thought the amount of focus on the SciGirls' Hispanic culture was about right, with less than a fifth (17%) saying there was too much focus and a tenth (11%) saying there was too little focus.

**Figure 14. Whether participants felt the episode gave the right amount of focus to the SciGirls' Hispanic cultural background**



### ***Right amount of focus***

When invited to comment on why they felt the episode had the right amount of focus, nearly a dozen girls and several parents elaborated. Most often they praised some aspect of the episode's focus on the SciGirls' cultural background, especially the focus on family and the focus on their background and country of origin, including how the episode connected their cultural background to their daily lives. A few praised the episode's emphasis on the SciGirls working together and working toward STEM careers. A sampling of the girls' and parents' comments on these themes follows below.

- *Girl: I enjoyed the background focus, but I think it should all be in the beginning rather than spread out during the episode.*
- *Girl: I like how they succeeded and how they were confident and they kept trying.*
- *Girl: I like that it was very interesting to see all the girls background and still work together.*
- *Girl: I liked how it showed who their family is and what they like.*
- *Girl: I liked how we got to see the real culture that the girls are a part of, and how that ties into their daily life.*
- *Girl: I liked the background and when they finished the dance.*
- *Girl: I think showing their families was a very good way to show Hispanic culture.*
- *Girl: It is the right amount of focus because in the episode it shows the girls telling us where they are from.*
- *Girl: It's very good because it shows where they are from and that they worked together*
- *Girl: They showed how Hispanic do things.*
- *Parent: Because they took care of every detail so that everything fit.*
- *Parent: I enjoyed how they had a balance of culture.*
- *Parent: I think girls and especially Hispanic girls need to see how far they can go in STEM.*

- *Parent: I thought it was interesting learning about the girls' cultural backgrounds and families.*
- *Parent: It shows that they are Hispanic from different nationalities.*
- *Parent: I liked that they all came together to give the best*
- *Parent: The mix of music, dance and science.*

As added context to this set of responses, note that during the brief discussion sessions held after participants completed their surveys, some participants elaborated on how well they thought the episode highlighted the SciGirls' different experiences and cultural backgrounds. As illustrated in the discussion excerpt below from the Florida group, participants were often quick to observe, and appreciate, the episode's diverse and nuanced narrative and visual references to the SciGirls' different Hispanic backgrounds. For example:

- *Girl 1: I think that when they were showing like a shirt of their country, I forgot which one, I think it was Spain or Columbia – a soccer shirt, I think that was a really good indicator and it showed her culture.*
- *Girl 2: It don't remember which one, but they were showing like a doll that they had from like Mexico or something. I thought that was good. It showed like more where they are from and what their culture is about.*
- *Girl 3: They also showed like their favorite food and I liked that.*
- *Girl 4: I liked how they like decorated their houses. I saw some like banners up and that showed where they were from.*
- *Girl 2: They also showed their families and their grandparents and told where they came from. It was interesting.*
- *Girl 5: Yeah they showed a lot of stuff that represents them, like the doll and how they like to cook for their families and like they were close with their families and they like introduced their entire family with them in their house and that's important because, like some cultures bring your family together. Family is really important to me.*
- *Girl 6: The pink Quinceañera pillow. I liked that.*
- *Mom 1: I agree. I thought that each girl had things representing her culture there and everyone pointed out, all the girls pointed out each, whether it was the pillow or the doll and someone had prepared a serrano ham. Something from their culture that made them – was unique to their culture. I thought that that was a positive.*
- *Mom 2: I think that what stuck out for me was that they had some family around and like that's a very Latin approach to life. It's like they were living with them and they were very proud to introduce them in their video diaries. It was a positive.*
- *Dad 1: Yeah, like um, family is such a big part of you know the culture that I felt that yeah it was good a very positive thing.*
- *Dad 2: Yeah, I have nothing new to add. Except the people that are watching it who are Latin, they know the fact that in a big group of Latin people there's many different cultures. For many of the people they know that. For the bilingual people they might not know that. I thought it was nice how they showed the families.*
- *Mom 3: I would like to know more about how the families got here. Because I was so impressed with how the girls were doing academically. And I'm sure for the parents to come here, it didn't look like they were very affluent, to hear stories and see how you can come from nothing and through education, girls can accomplish anything. You know what might be interesting. In every segment, focus on one girl and say oh, you know if they can, how the parents got here, what they started with. Maybe on the website. You know the girls seem so self-confident. You know did the mothers have that? What hardships did they have? It would just be interesting to see how they got there.*

### **Too little focus**

When invited to comment on why they felt the episode had too little focus on the SciGirls' Hispanic cultural background, the few girls and parents who elaborated suggested including more examples from the SciGirls' daily lives or more backstory about: their roots, their reasons for



liking STEM, and/or their thoughts about how life in America has changed their lives. A couple suggested more Spanish or Latin music. A sampling of girls' and parents' comments follows below:

- *Girl: Can there be examples of what they do in their daily life?*
- *Girl: I think there should be more filming where the girls talk about themselves and when the show their house.*
- *Girl: I think they should put more backstory into it and why it motivated them to do STEM.*
- *Girl: I would like to see included more on the topic for example if its digital dance than about that and in the episode, it went to a house, digital dance, school, etc.*
- *Parent: I'd like to get a focus on what it means to be an American and focus on how America changed their lives.*
- *Parent: Maybe if they can talk more about their roots.*
- *Girl: They should include Spanish music*
- *Parent: More Hispanic music*
- *Parent: The music could be something like more classic Latin*

### **Too much focus**

When invited to comment on why they felt the episode had too much focus, the few girls and parents who elaborated explained that they felt the episode already had a focus on this theme, or suggested it focused on too many family members who weren't relevant to the episode, as in:

- *Girl: I think the episode is focusing a lot of the girls' background.*
- *Girl: They did not have to show all about them.*
- *Parent: Meeting all the members of the family.*
- *Parent: Shots of family that did not participate in the show. Make it more relevant to the episode and girls in the show.*

## **1.10 How participants felt about the episode's integration of families in key scenes**

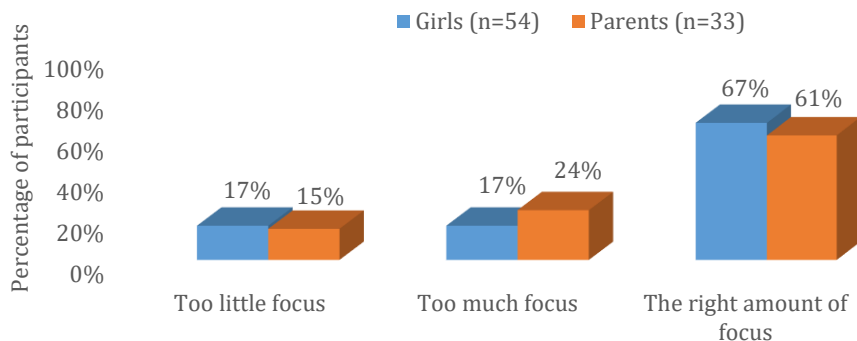
### **1.10a How participants felt about the focus on families in the video diaries**

Participants were informed of the following information prior to being asked a question about an episode segment that featured families: *Each SciGirls episode features video diary segments wherein the girls create their own video diary to introduce themselves and their families. The girls talk about their home lives and interests, sometimes showing pets, musical instruments, sports, and homes. In the case of Digital Dance, the episode highlights the lives and families of Marielly, Marilyn, Sheira, and Nazaret, as shown in the [picture] to the right.* Participants were then asked: *Do you think there is too much focus on family members in these video diary segments, too little focus, or the right amount of focus? Please select one and explain your answer.*



As shown in Figure 15, the majority of participants felt that the video diary segments featured the right amount of focus on family members. Specifically, about two-thirds (67%) of the girls thought these segments featured the right amount of focus, while less than one-fifth each thought there was too much (17%) or too little focus (17%). Meanwhile, from the parents' perspective, nearly two-thirds (61%) thought the segments featured the right amount of focus on family members, while a quarter (24%) thought there was too much focus and more than one-tenth (15%) thought there was too little focus.

**Figure 15. Whether participants felt the episode's video diary segments gave the right amount of focus to family members**



### ***Right amount of focus***

When invited to comment on why they felt the video diary segments had the right amount of focus, of the roughly one-third of girls and parents who elaborated, most praised one or more aspects of the video diary segments' focus on families. Most often they liked that the segments: shared personal insights about the SciGirls, showed their everyday lives and unique backgrounds, highlighted the families' pride in and support of the SciGirls, and/or offered a break from the science. A sampling of the girls' and parents' comments on these themes follows below.

- *Girl: Because they worked and showed what they do.*
- *Girl: I bet they really like how their girls did on Digital Dance!*
- *Girl: I like how it teaches us about themselves to know more about them.*
- *Girl: I liked to see that anyone can do anything.*
- *Girl: I see the family so excited about it.*
- *Girl: It showed their everyday lives.*
- *Girl: The family is really nice to the girls and helped them in their project.*
- *Girl: The occasional break from science was nice, and it helped me relate to the girls.*
- *Girl: They are different and unique people*
- *Girl: They seemed like nice people.*
- *Girl: They supported the girls.*
- *Parent: Because it was a perfect amount*
- *Parent: Because they did their best and should show what they did at first.*
- *Parent: Because we should know a little about them*
- *Parent: Because then the girls that are watching learn more about the girls*
- *Parent: Having the families provides something else Latina girls can relate to.*
- *Parent: It shows what they think*
- *Parent: It was right because the parents were proud.*
- *Parent: Liked that the parents hugged them when they were done.*
- *Parent: Showing the girls parents are important.*
- *Parent: They should show the same amount because they shared a show with their families.*

### ***Too little focus***

Among the several girls and parents who elaborated on why they felt the video diary segments gave too little focus to families, most indicated that the segment could include even more about the featured families and, in particular, they wanted to know more about: their lives, their countries of origin, what they do for a living, and how they influenced their daughters, among other topics. The girls' and parents' comments included:

- *Girl: I want to hear more about what their parents do and how that influenced them to get into coding.*
- *Girl: I wanted to learn more about the girl's families.*
- *Girl: They could tell more about their lives.*
- *Girl: Maybe show how it helped them get that far?*
- *Parent: Family is huge in the Hispanic culture so I feel as if it should be included more in the series.*
- *Parent: Because it is fun.*
- *Parent: Because I wanted to see more about their lives.*
- *Parent: How the family immigrated to the U.S. Each episode can spend a few minutes on the family background. Everyone loves a happy ending.*
- *Parent: They should show what their parents do for a living.*

### ***Too much focus***

A couple of girls and a couple of parents who indicated that the video diary segments gave too much focus to families explained why they felt that way, with both girls and one of the parents preferring the episode focus more on science, as in:

- *Girl: SciGirls should focus more on science*
- *Girl: Because the episode is about science not your family.*
- *Parent: I would like more focus on technology than their families.*

As added context to this set of responses, note that in one of the brief discussion sessions that followed the survey in Tennessee, parents discussed the use of the home setting in the episode. In this case, a few mothers agreed that they felt that the parts of the episode that highlighted the SciGirls' homes were *too private*, elaborating that they felt that a family's house should be reserved for *personal* family time. These same parents were very positive about the episode showcasing the SciGirls' interactions through the school, dance performance, and final share.

Looking across the surveys and other discussion sessions, however, this perspective did not surface elsewhere. Parents and girls were generally positive about the value of seeing aspects of the SciGirls' homes, "everyday lives," and diverse cultures, as shared below. Examples of comments from other discussion sessions are provided as contrast.

- *Girl (discussion): I liked how they like decorated their houses. I saw some like banners up and that showed where they were from.*
- *Girl (discussion): Yeah they showed a lot of stuff that represents them, like the doll and how they like to cook for their families and like they were close with their families and they like introduced their entire family with them in their house and that's important because, like some cultures bring your family together. Family is really important to me.*
- *Parent (discussion): I liked the focus on the girls and their families and the sort of day in the life approach. Without saying a lot we got to see their houses, rooms, family members, hobbies and a lot really that gave us a good feeling for who these girls are as people and how important their families are. I like that.*
- *Parent (discussion): Family is really important but I think it is kind of original how they did this in a science show for girls. It felt natural and was interesting to see.*

## 1.10b How participants felt about the focus on families in the final sharing scene

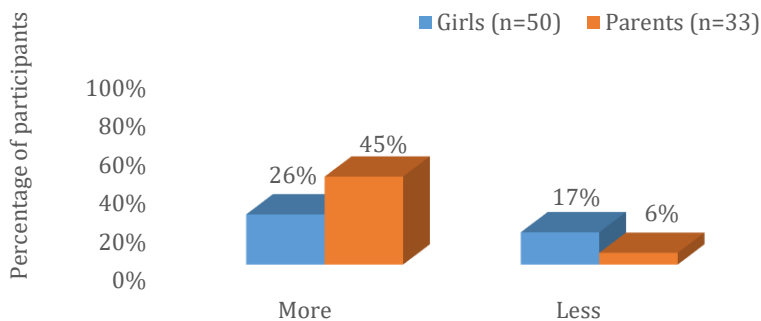
In order to ask participants about the episode’s final sharing scene, participants were reminded that: *Towards the end of the episode, the girls presented their digital dance to an audience of friends and family members, as shown in the pictures to the right.* They were then asked: *Do you recommend that the team include families more or less in these sharing scenes, or should it stay the same?* They were also asked to explain their choice and provide any suggestions.



As Figure 16 shows, about half each of the girls (50%) and parents (48%) felt the amount of focus was just right, while nearly half of the parents (45%) and one-quarter (26%) of the girls felt there should be a greater focus on families. Relatively few girls (17%) and parents (6%) felt there should be less of a focus.



**Figure 16. Whether participants preferred the final sharing scenes show families more, less, or the same amount**



### ***Right amount***

When invited to comment on why they felt the final sharing scene had the right amount of focus, a handful of participants commented variously as follows:

- *Girl: It is fun*
- *Girl: They did their best and it is fun for the parents to see*
- *Girl: I thought it was just the right amount.*
- *Parent: It was the right amount.*
- *Parent: Reflects Hispanic Culture and Family*

## **More focus**

When invited to comment on why they felt the final sharing scene could have more focus on families, several girls and parents elaborated, pointing to the importance of family in Hispanic culture, the episode's limited focus on just one family currently, or some other aspect of the segment. The girls' and parents' comments included:

- *Girl: Other people who watch the show might relate and might like the videos.*
- *Girl: Only one girl's parents were shown.*
- *Girl: Family is huge in the Hispanic culture so I feel as if it should be included more in the series.*
- *Girl: Because only one girls parent showed up before the dance.*
- *Parent: I think the families were overjoyed to see the girls to something that they have never done. It shows that a new generation is coming in and changing the world around us for the better.*
- *Parent: Just invited more audience.*
- *Parent: More backstory.*
- *Parent: Perhaps choose 1 or 2 girls and give a brief storyline.*
- *Parent: You need more audience to have more motivation*
- *Parent: They should show parents be more present in the support of the project.*
- *Parent: Maybe the family should look a bit more happy to be the focus.*

## **Less focus**

None of the participants explained their reason for selecting less focus in the sharing scenes.

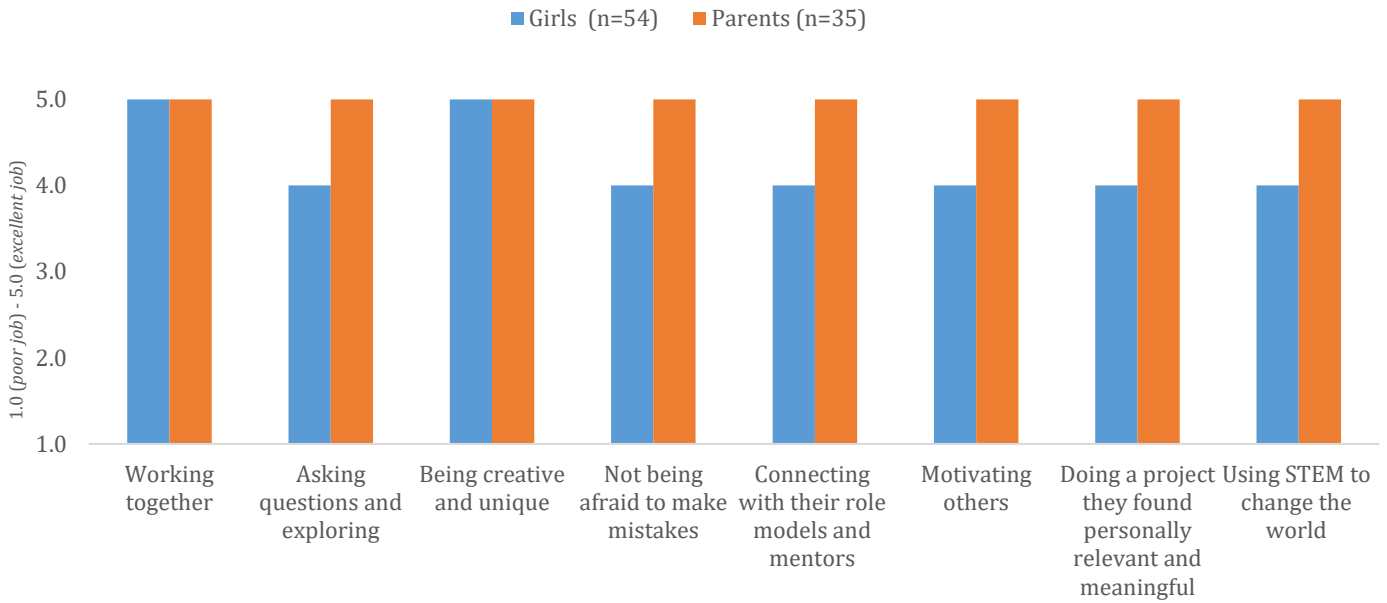
## **1.11 How participants responded to various aspects of the *SciGirls* project and science process/engineering design scenes**

Every *SciGirls* episode features a science process or engineering design project. In the *Digital Dance* episode, the *SciGirls* added technology to a dance with the help of a professional mentor, in this case their teacher/the leader of TechCrew. Participants were asked to consider several aspects of the scenes, including the pace, density, and level of the science/technology featured, as presented in sections 1.11a – 1.11d.

### **1.11a How good a job participants felt the episode did in showing the *SciGirls* work on projects**

Participants were asked to rate how good a job the episode did in showing the *SciGirls* participating in ways reflective of the *SciGirls Seven*, using a scale from 1.0 (*poor job*) to 5.0 (*excellent job*) in each case. As shown in Figure 17 on the next page, girls and parents both generally rated the episode as doing an *excellent job* of showing the *SciGirls* working together (*Mdn* = 5.0) and being creative and unique together (*Mdn* = 5.0). On the remaining ways of participating (asking questions and exploring, not being afraid to make mistakes, connecting with their role models and mentors, motivating others, doing a project that is personally relevant and meaningful, and using STEM to change the world) the girls generally rated the episode as doing a *good job* in each area (*Mdn* = 4.0) while the parents rated the episode as doing an *excellent job* in each respect (*Mdn* = 5.0).

**Figure 17. Participants' median ratings of how good a job the episode did in showing the SciGirls participate in ways reflective of the *SciGirls Seven***



Tables 13 and 14 show the percentage of participants in each group that chose each rating.

	Poor job 1.0	Fair job 3.0	Excellent job 5.0
Working together	0%	4%	78%
Asking questions and exploring	2%	22%	43%
Being creative and unique	2%	9%	70%
Not being afraid to make mistakes	6%	19%	37%
Connecting with their role models and mentors	0%	22%	46%
Motivating others	2%	19%	41%
Doing a project, they found personally relevant and meaningful	11%	15%	41%
Using STEM to change the world	9%	22%	39%

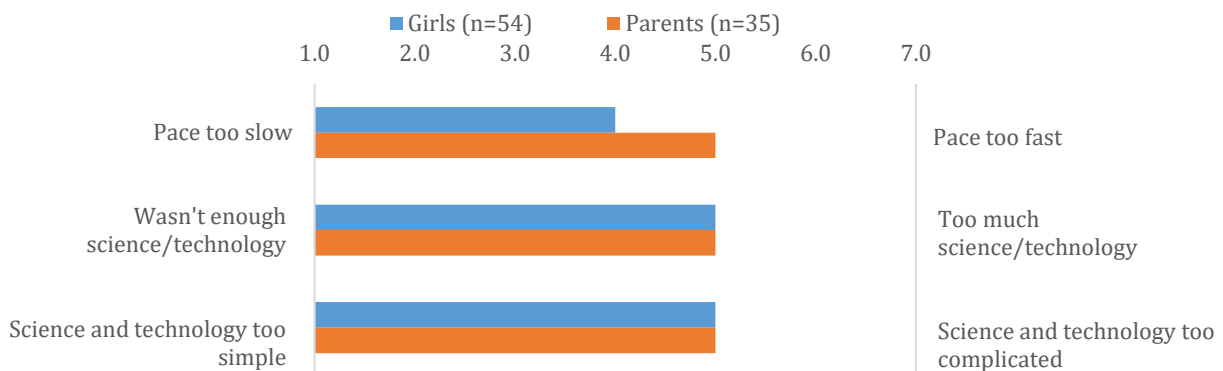
**Table 14. Frequency distribution of how good a job parents felt the episode did in showing the SciGirls participate in ways reflective of the *SciGirls Seven* (n=35)**

	Poor job 1.0	Fair job 3.0	Excellent job 5.0
Working together	0%	6%	80%
Asking questions and exploring	0%	9%	66%
Being creative and unique	0%	9%	77%
Not being afraid to make mistakes	3%	11%	66%
Connecting with their role models and mentors	0%	17%	66%
Motivating others	0%	17%	77%
Doing a project, they found personally relevant and meaningful	0%	9%	77%
Using STEM to change the world	3%	23%	54%

### 1.11b How participants rated the pace and density and level of the science/technology

Participants were asked to rate the design project scenes in terms of pace and the amount and level of science/technology featured on a scale from 1.0 (rated the lowest) to 7.0 (rated the highest), with 4.0 being “just right” in each case. Figure 18 shows the median ratings for girls and parents. While girls generally felt the pacing of these scenes was about right (*Mdn* = 4.0), parents felt it was slightly too fast (*Mdn* = 5.0). Both girls and parents generally indicated that there was a little too much science/technology in the scenes (*Mdn* = 5.0 each) and that this information was a little too complicated (*Mdn* = 5.0 each).

**Figure 18. Median ratings of how participants felt about the project's pace and density and level of science/technology**



Tables 15 and 16 on the next page show the percentage of participants in each group that chose each rating.

Table 15. Frequency distribution of how girls felt about the project's pace, amount of science/technology, and level of science/technology (n=54)								
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	
Pace was too slow	15%	4%	7%	50%	17%	6%	2%	Pace was too fast
There wasn't enough science/ technology	4%	9%	2%	28%	20%	13%	24%	There was too much science/ technology
The science/ technology was too simple	6%	7%	6%	26%	20%	13%	22%	The science/ technology was too complicated

Table 16. Frequency distribution of how parents felt about the project's pace, amount of science/technology, and level of science/technology (n=35)								
	1.0	2.0	3.0	4.0	5.0	6.0	7.0	
Pace was too slow	11%	6%	3%	17%	29%	23%	11%	Pace was too fast
There wasn't enough science/ technology	6%	0%	11%	17%	29%	20%	17%	There was too much science/ technology
The science/ technology was too simple	3%	0%	6%	26%	34%	20%	11%	The science/ technology was too complicated

When invited to explain their ratings, less than half of the girls and parents elaborated. Those who referenced the pace of the design project scenes tended to describe the pace as slow or about right. Those who elaborated on the science/technology level or density indicated they wanted: more explanation or process featured in the scenes, more technology, and/or greater complexity in the technology project. A sampling of their comments follows below, with feedback from girls and parents presented together.

**Pace**

- Girl: It was too slow and the iPads. The pace was too slow for kids.
- Girl: It's so boring. Make it in English
- Parent: I feel the pace was just right and tech info was interesting.
- Parent: Slow pace. Wasn't sure what the focus on goal was in the beginning.

**Science level right**

- Girl: They took their time in working things out.
- Girl: There was enough science for me and the science/technology was not simple.
- Girl: I do the exact same coding in school and it is very simple.
- Parent: Just right amount of tech for this group of girls.

**Wanted more technology, more complexity**

- Girl: I think there was not enough technology and that the technology was too simple because the girls did say much about what they were doing.
- Girl: The science should be more difficult.
- Girl: There should be more technology.
- Parent: Demonstrate more technology and projects



- Parent: I felt that the episode should be called "Preparing Seamstress" for the 21st Century I didn't see much coding other than the lumiballs bit.
- Parent: I think it was too simple.
- Parent: Would have liked to have seen more science.

#### **Wanted more explanation or process**

- Girl: Explain what they are doing
- Girl: Explain more about how the spheres work.
- Girl: I think they could make the episodes better by explaining what the items they're using clearly.
- Girl: I thought the science technology was too difficult.
- Girl: The technology was very complicated because I didn't really know how they lit up the balls.
- Girl: There should have been a little more explanation behind the coding answering how/why they do things.
- Girl: They made it a bit too fast to understand.
- Parent: I would like to know which technologies they used and how long it took them to learn.
- Parent: The dance did not have different movements (fast-slow) where the difference of the lights could really be seen.
- Parent: Would have liked to have seen more details about the coding.
- Parent: Play a little more with the lights

As added context to this set of responses, note also that in the discussion sessions held in California and Tennessee, several parents suggested that the episode spend more time showing and explaining the "making" process. These parents wanted the episode to show more in depth how the SciGirls learned to code, used coding in general, or how they did the coding in the episode, in some cases explaining that showing the "how" would make the episode more interesting. One parent suggested that the process could be conveyed more like a how-to cooking show.

### **1.11c Participants' suggestions for what else the project or final share scenes might include**

Participants were asked if there was anything else they would like to see the project or final share scenes focus on more. One-third of the girls (35%) and just under one-third (31%) of the parents offered suggestions. Their suggestions most often focused on desiring a greater emphasis on: the process or how the coding project evolved, the mentors and teachers involved in the project, and the SciGirls' friends and other students. A sampling of girls' and parents' comments follows below.

#### **More process/how project evolved**

- Girl: I would like to see more of the process and stages of progress throughout the video.
- Girl: I would like to see more of their ideas of planning stuff.
- Girl: I'd liked to see more reaction, and how it affected them.
- Girl: More on their project.

#### **Mentors**

- Girl: More on the girl's mentor
- Girl: More on the mentors.
- Girl: ...more time with their teachers.
- Parent: The mentors
- Parent: Their teachers and school.
- Parent: Yes, definitely want more mentor's info!

#### **Their other friends/students**

- Girl: Their friends
- Girl: Their other friends, students
- Girl: More on the student.
- Parent: School Kids

- Parent: Their friends or other students.
- Parent: Include their fellow schoolmates & friends.

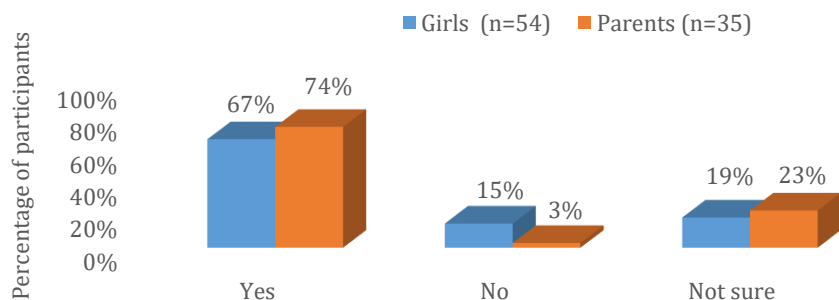
**Miscellaneous**

- Girl: Subtitles.
- Girl: They should include more English
- Girl: Their celebrations
- Parent: Technology.
- Parent: Where are programs offered to girls interested in programming? Are there summer camps where girls can go to and are there grants and/or scholarships. I would like this to include high school girls. My older daughter and her friends love science and math but have not been exposed to any programming. Where are the opportunities for my 15-year-old daughter?

**1.11d Whether participants felt that watching the SciGirls’ project increased their interest in doing projects**

The girls were asked if watching the SciGirls do their project made them want to try a science/technology project of their own, while parents were asked if, after watching, they felt like encouraging their daughters to try a science/technology project on their own or with them. Figure 19 presents the types of responses shared by both groups.

**Figure 19. Whether girls felt that watching the SciGirls do their project made them want to try one of their own (and whether parents felt like it encouraged them to help their daughters to do a STEM project )**



Responses from girls and parents are summarized below, followed by examples of their specific comments in each area, with feedback from both groups presented together.

**Girls:** Among the 54 girls, about two-thirds (67%) selected *Yes*, a fifth (19%) selected *Not sure*, and less than one-fifth (15%) selected *No*. Girls who selected *Yes* were asked what type of project they would like to try. A fifth (20%) of the girls described wanting to try something like the digital dance, and more than a tenth each wanted to try a coding project (15%) or another STEM project (13%). Less than one-tenth each wanted to make a robot (6%) or shared miscellaneous comments (2%). Girls who selected *Not sure* were asked why they weren’t sure. Less than a tenth each said it looked hard (4%), that they wouldn’t know what to do (4%), or expressed uncertainty (4%). Finally, girls who selected *No* were asked why they wouldn’t like to try a project on their own. Here, less than one-tenth each said they weren’t interested (7%) or weren’t good at science (2%).

**Parents:** Among the 35 parents, nearly three-quarters (74%) selected *Yes*, about a quarter (23%) selected *Not sure*, and one (3%) selected *No*. Those who selected *Yes* were asked what type of project they would like their daughter to try and whether it would be on her own or with them. More than a quarter (29%) said they would want to work with their daughter, and less than one-tenth (9%) suggested she would work on her own. In terms of projects, more than a tenth (14%) wanted their daughters to work on other STEM projects, while less than one-tenth each wanted their daughters to try something like the digital dance (9%), said their daughters already did STEM projects (6%), or shared miscellaneous feedback (6%). Those who selected *Not sure* were asked why they weren't sure, with less than a tenth each citing lack of time (6%), daughters' lack of interest (6%), and lack of knowledge (3%). Those who selected *No* were asked why they wouldn't like their daughter to try a project; here, the only parent declined to elaborate.

**Yes, want to try a project (67%)**

***Want to try something like the digital dance (20%)***

- *Girl: I want to try the project that the girls did because when the girls were being filmed I was inspired.*
- *Girl: The tutus are so cool because I am a ballerina.*
- *Girl: Make a sweater glow up.*
- *Girl: The Sphero it's so cool. I liked it.*

***Want to try a coding project (15%)***

- *Girl: Attempt to learn to code.*
- *Girl: I've always been interested in a career in engineering but now I'm slightly more interested in computer science.*
- *Girl: I think I would like to try a coding project.*

***Want to try another STEM project (13%)***

- *Girl: I would like to see the amount of time each color transfer. And seeing how.*
- *Girl: It looks interesting, I would like to do mini figures or mini houses with the lights to work.*

***Want to make a robot (6%)***

- *Girl: Projects with robots.*
- *Girl: I would like to try making a robot.*

***Want to work with their daughter (29%)***

- *Parent: I would like to work with her and try something similar.*
- *Parent: With me absolutely, and the project that she chooses.*
- *Parent: I would like to help support her school and the group.*

***Daughter would work independently (9%)***

- *Parent: On her own.*
- *Parent: I would love to see both of my girls do a project together.*

***Want daughters to try another STEM project (14%)***

- *Parent: I would love for her to go to a STEM summer camp with other girls from all backgrounds.*
- *Parent: Codes with me*
- *Parent: We have to do one after this. It will have more science in it!*

***Want daughters to try something like the digital dance (9%)***

- *Parent: I would like to work with her and try something similar.*
- *Parent: How to work the technology the way they did.*
- *Parent: Fashion and technology*

***Have already done STEM projects (6%)***

- *Parent: We've done solar powered cars and she did great. (Always with us - me)*
- *Parent: My girls love experiments and they do them on their own.*

**Miscellaneous (2%)**

- Girl: Yes, because it is interesting
- Parent: I liked the technology.

**Not sure if I want to try a project (19%)**

**It looks hard (4%)**

- Girl: Because it looks hard
- Girl: Finding these types of technology and being able to operate it seems difficult.

**Wouldn't know what to do (4%)**

- Girl: I don't know much about it.
- Girl: I wouldn't know what project to do.
- Parent: Because we don't know much about science and technology

**Unsure (4%)**

- Girl: Because I am not sure.
- Girl: Wasn't really interested before, but It looks kind of fun.

**Don't have time (6%)**

- Parent: I do not know if I have the time to use it.
- Parent: Because I am single mom and I have three children I do not think I have time to accompany my daughters.

**Daughter not interested (6%)**

- Parent: STEM is not relevant to her interests and activities right now.
- Parent: She is not too interested in computers.

**No, don't want to try a project (15%)**

**Not interested (7%)**

- Girl: I'm not interested in this field of science.
- Girl: I'm not really interested in coding.

**Not good at science (2%)**

- Girl: Because I'm not good at science.

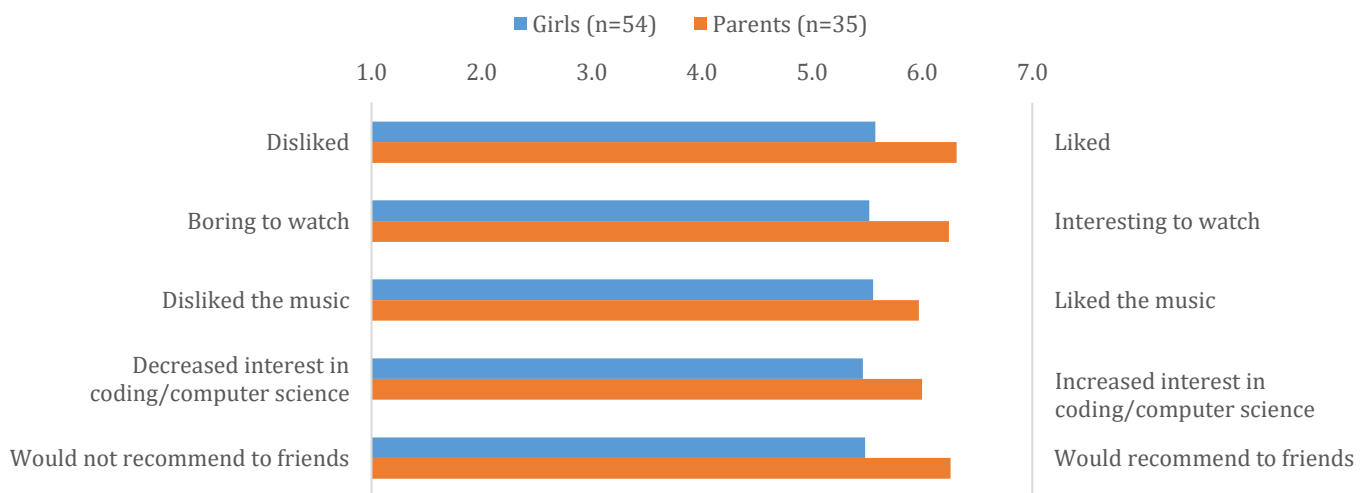
## Part 2: Participants' feedback on the STEM role model video



### 2.1 How appealing participants found the video

Participants were asked to rate aspects of the appeal of the STEM role model video, including the extent to which they liked it, found it interesting or boring to watch, liked or disliked the music, felt the video increased or decreased their interest in computer science/coding, and thought they would or wouldn't recommend it to friends. In each case, they used a scale from 1.0 (rated the lowest) to 7.0 (rated the highest). Based on these indicators of appeal, the overall scale means show that both girls and parents generally found the video appealing, though parents tended to find it somewhat more appealing than did girls (Girls:  $M = 5.1$ ,  $SD = 1.49$ ; Parents:  $M = 6.1$ ,  $SD = 1.01$ ).<sup>15</sup> Figure 20 presents the mean ratings for the individual items for both groups.

**Figure 20. Participants' mean ratings of the STEM role model video's appeal**



<sup>15</sup> Cronbach's alpha for this five-item scale in the current evaluation is as follows: Girls  $\alpha = .90$ , 95% CI [.85, .94]; Parents  $\alpha = .92$ , 95% CI [.88, .96]. This scale has been used previously by the authors in studies of science-based film and television documentaries.

Responses from girls and parents are summarized below, followed by examples of their comments.

**Girls:** Though they shared a range of ratings, as shown in Table 17, the mean ratings indicated that overall, the girls liked the video ( $M = 5.6, SD = 1.81$ ), found it interesting to watch ( $M = 5.5, SD = 1.86$ ), liked the music featured ( $M = 5.6, SD = 1.35$ ), felt the video increased their interest in computer science/coding ( $M = 5.5, SD = 1.82$ ), and expected they would recommend it to friends ( $M = 5.5, SD = 1.87$ ).

	1.0	2.0	3.0	4.0	5.0	6.0	7.0	
Disliked overall	7%	2%	4%	7%	19%	15%	46%	Liked overall
Boring to watch	7%	2%	6%	11%	9%	20%	44%	Interesting to watch
Disliked the music	0%	4%	4%	13%	24%	24%	31%	Liked the music
Decreased my interest in coding/ computer science	4%	6%	6%	17%	9%	13%	46%	Increased my interest in coding/ computer science
Would not recommend to friends	7%	4%	2%	13%	13%	17%	44%	Would recommend to friends

**Parents:** Though they shared a range of ratings, as shown in Table 18, the mean ratings indicated that, overall, parents liked the video ( $M = 6.3, SD = 1.08$ ), found it interesting to watch ( $M = 6.2, SD = 1.36$ ), liked the music featured ( $M = 6.0, SD = 1.35$ ), felt the video increased their interest in computer science/coding ( $M = 6.0, SD = 1.26$ ), and expected they would recommend it to friends ( $M = 6.3, SD = 1.15$ ).

	1.0	2.0	3.0	4.0	5.0	6.0	7.0	
Disliked	0%	0%	3%	6%	11%	17%	63%	Liked
Boring to Watch	0%	3%	3%	3%	3%	33%	55%	Interesting to watch
Disliked the music	0%	0%	3%	11%	11%	34%	40%	Liked the music
Decreased my interest in coding/ computer science	0%	3%	3%	9%	6%	37%	43%	Increased my interest in coding/ computer science
Would not recommend to friends	0%	3%	3%	0%	9%	31%	54%	Would recommend to friends

When invited to elaborate on their ratings, some of the girls and parents suggested that they would have liked to know more about the role model's personal life or work, or brought up a language issue. A sampling of girls' and parents' comments on each theme are shared below:

#### **Praised aspect of video**

- *Girl: This episode was also very interesting and it increased my interest for coding/computer science.*
- *Girl: Her Spanish was perfect and easy to follow and there was just the right amount of everything, about her career, life, interests.*
- *Girl: I like the video because it really inspires Hispanics, Latinos, etc. that they can do anything.*
- *Parent: She is super intelligent*
- *Parent: I liked her a lot. She was very clear, focused, inspiration and a good role model for my daughter.*
- *Parent: She was charismatic. I enjoyed the storyline from both to immigrant to college to success.*
- *Parent: I thought this was excellent*
- *Parent: It's nice how they share their lives with youth, inspiring.*

#### **Wanted more about her work**

- *Girl: I think that the video didn't explain what she did at all. It only explained about her personal background.*
- *Girl: It should have more about science and coding.*
- *Parent: It could have focused a little more on why she became interested in science.*
- *Parent: It really didn't get into coding or specifically what she did.*

#### **Wanted more about her personal life**

- *Girl: The video could be better if Natalia could explain more about her life.*
- *Girl: They shouldn't put so much info about the computer science or coding.*
- *Parent: More personal. Only to motivate the students more*

#### **Language issues/wanted English/subtitles**

- *Girl: It should have the English subtitles or be available in English.*
- *Girl: I couldn't understand or really follow what was happening/subtitles.*
- *Parent: It would be better in English.*
- *Parent: Just a couple of words spoken incorrectly.*

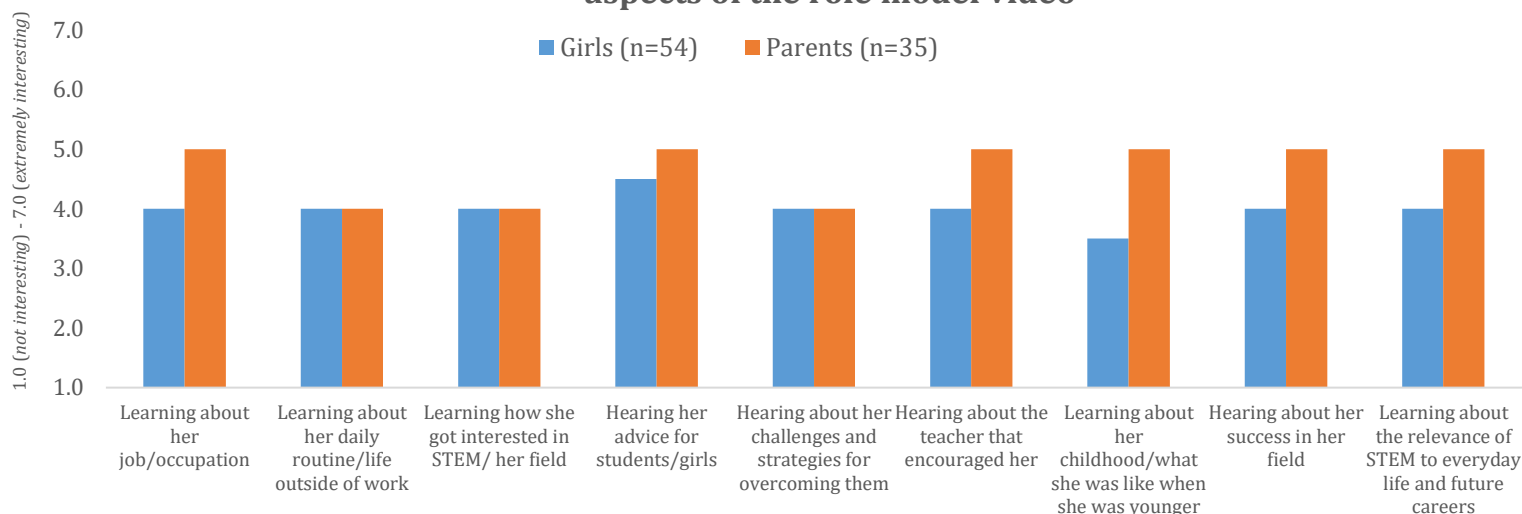
## **2.2 How interesting participants found aspects of the video**

Participants were asked to rate how interesting they found learning (or hearing) about several different aspects of the role model's life, using the scale from 1.0 (*not interesting*) to 5.0 (*extremely interesting*) in each case.<sup>16</sup> As shown in Figure 21 on the next page, overall, girls were *very-to-extremely interested* (*Mdn* = 4.5) and parents *extremely interested* (*Mdn* = 5.0) to hear about the role model's advice for students/girls. Overall, girls were *very interested* (*Mdn* = 4.0) and parents *extremely interested* (*Mdn* = 5.0) to learn about the role model's occupation, the teacher who encouraged her, her success in her field, and the relevance of STEM to everyday life and future careers. Both girls and parents were generally *very interested* (*Mdn* = 4.0) to learn about the role model's daily routine/life outside of work, how she got interested in STEM/her field, and her challenges and strategies for overcoming them. Finally, girls were generally *fairly-to-very interested* (*Mdn* = 3.5) while parents were *extremely interested* (*Mdn* = 5.0) to learn about her childhood/what she was like when she was younger.

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<sup>16</sup> Individual median ratings as opposed to overall mean scores are provided in this section as the statements do not comprise a scale but are rather a list of distinct learning goals developed for the film.

**Figure 21. Median ratings of participants' interest in various aspects of the role model video**



When invited to explain their ratings, most of the girls who elaborated either praised an aspect of the video or mentioned something they would have like to see more of (e.g., more kids, STEM, or information about the role model's life). Several other girls suggested adding subtitles or using more English, or briefly commented that they didn't like or couldn't relate to the video. Of the parents who elaborated, all but one praised an aspect of the video. A sampling of the girls' and parents' comments follows below.

**Aspects liked**

- *Girl: I enjoyed that the video was all the way through in Spanish and easy to follow.*
- *Girl: Liked that Andrea could work with animals. The teacher sounded nice and liked that as she was growing up she learned more English.*
- *Girl: The video was interesting...it explained her work and because it told us how she got interested in that job.*
- *Parent: It's interesting to hear of other people's career advice and the effort it took*
- *Parent: Interesting to know she also likes acting to show girls they do not have to be one dimensional.*
- *Parent: She is an example for many Latina to follow*

**Would like to learn more about....**

- *Girl: I didn't hear much about STEM in this video. That didn't feel like a main take away.*
- *Girl: I would like to get advice for younger girls and how she got into stem.*
- *Girl: I would like to learn more about her.*
- *Parent Very good! I did not see much of outside life. I would have liked to hear her road blocks and how she overcame them.*

**Add subtitles/more English**

- *Girl: It needs a little bit of more English*
- *Girl: They should put subtitles in English so the ones that don't speak Spanish can understand.*
- *Parent: English subtitles or in Spanglish.*

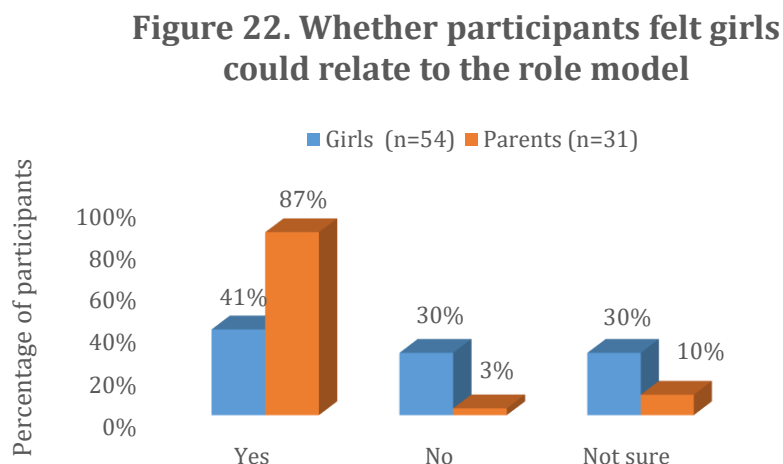
**Didn't like or couldn't relate**

- *Girl: It is not relevant to show her outside life with the plot that is put in.*
- *Girl: I couldn't relate or understand well.*



## 2.3 Whether participants felt the featured role model was relatable

Girls were asked if they felt they could generally relate to the featured role model and her life, while parents were asked if they felt their daughters could relate. As shown in Figure 22, nearly nine-tenths (87%) of parents compared to two-fifths (41%) of girls answered *Yes* to this question. The remaining girls answered *No* (30%) or *Not sure* (30%) while the remaining parents answered *No* (3%) or *Not sure* (10%).



Among the girls and parents who said *Yes* and elaborated, they most often said that they liked an aspect of the role model's personality (e.g., *talkative, creative, positive*) or that she shared similar interests with the girls. Some also pointed to the fact that she is Latina and a good role model in general, or said they too liked tech/coding. Among girls and parents who said *No* and elaborated, most noted that coding or computer science weren't of interest to the girls or that the role model was considerably older. Among the girls and parents who said *Not sure* and elaborated, participants offered the same reasons as those who said *No*, added that they had a *different upbringing*, or said they just didn't know. A sampling of girls' and parents' comments is below.

### Yes, can relate

#### **Outlook/personality**

- *Girl: She was very positive.*
- *Girl: When she described herself she also described me (talkative, creative).*
- *Girl: She is very smart.*
- *Parent: More so than the girls in the previous video. I think she is more like the people we know in Miami. Why? It can't be the Mexican heritage so it must be because she is more attractive and stylish than the girls and family who came across as first gen immigrants.*
- *Parent: It shows if you work hard you can achieve a successful career.*
- *Parent: Because she is very clear on what she wants, she likes to work on her projects, she loves to study and she is a very good student. I am very sure that she will get to her goals.*

#### **Share similar interests**

- *Girl: She has almost the same interests as me.*
- *Girl: Yes, because I like to draw.*
- *Parent: She loves animals and having them in the museum was great.*
- *Parent: Well my daughter...loves to draw and [my other daughter] loves animals and both technology.*

#### **Good role model**

- *Girl: She is a role model because she makes kids think I should study more to grow up like her.*
- *Girl: She shows me that my dream can come true.*
- *Girl: She is really inspiring and it motivates me in coding and computer science.*
- *Parent: It is a model, to be sure.*

### **Being Latina**

- *Girl: She immigrated to the United States and became something no one really expects from a woman.*
- *Parent: She is a young Latina that made it in the real world.*

### **Like computers/coding/technology**

- *Girl: I really like technology.*
- *Girl: I like coding just like her.*

### **Miscellaneous**

- *Girl: I also have trouble deciding what I want to be when I grow up.*
- *Parent: Primarily because she's young...*

### **No, can't relate**

#### **Not interested in computer science/coding**

- *Girl: No because I am not interested in what she likes and what field she is in. It's too much work.*
- *Girl: I don't have an interest in coding.*
- *Parent: She is not interested in computers or that work.*

#### **She's older**

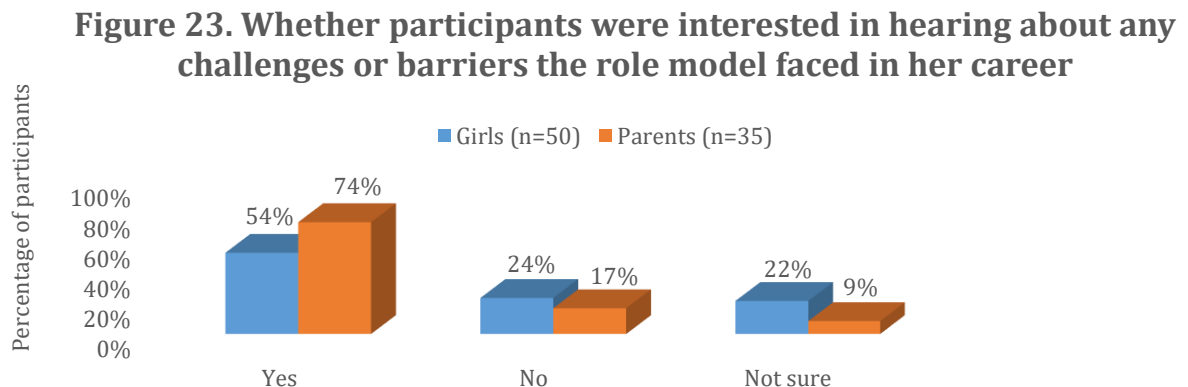
- *Girl: Not really. She was a lot older and had graduated already and I can't relate to that.*
- *Girl: It would be easier to relate to Natalia Rodriguez if I was more her age.*

#### **Not sure**

- *Girl: Not sure if in future sharing the same interests as her.*
- *Girl: I don't know as much of coding as she does.*
- *Girl: I don't know if I could relate to her.*
- *Parent: It is still a bit small to give up your interest to something you would like to be great.*

## **2.4 Whether participants were interested in hearing about challenges or barriers the role model faced**

Participants were asked if they would be interested in hearing more about any challenges or barriers that the STEM role model faced in her career. As shown in Figure 23, three-quarters (75%) of the parents and more than half (54%) of the girls reported *Yes*, they were interested. The remaining half of the girls reported *No* (24%) or *Not sure* (22%) while the remaining one-quarter of parents reported *No* (17%) or *Not sure* (9%).



When invited to explain their ratings, most of the girls and parents who said they were interested in hearing about the role model's challenges elaborated, describing this information as *interesting, real, important, relatable, inspiring, and/or motivating*. A handful of girls and parents who said they weren't interested in hearing more on this topic elaborated, saying that they weren't interested in the role model's career, that the video already provided enough information, or that the topic would be *boring, irrelevant, negative, or too specific*. A few girls who said *Not sure* offered various perspectives, for example noting that the video already covered this information or questioning whether the role model would want to share this information. None of the parents who chose *Not sure* elaborated. A sampling of comments from girls and parents is below.

#### **Yes, interested**

- *Girl: Natalia's career is really interesting so I would like to know more about her.*
- *Girl: I can see that she struggled to be where she is now, that is inspiring.*
- *Girl: I want to see the challenges she faced in her career that inspired her.*
- *Girl: It would be very inspiring in how she kept on going and how she never gave up.*
- *Girl: I'd like to know what to do to get into a STEM career and be prepared for the challenges to get there.*
- *Girl: She did not talk about it that much.*
- *Parent: I would like to hear if there were any challenges and how she overcame them.*
- *Parent: It would be a greater motivation for all young people and they know that it will not be easy but it also isn't impossible.*
- *Parent: I would like my daughters to say that they can because she is an example.*
- *Parent: She became who she is due to those challenges.*

#### **No, not interested**

- *Girl: I am not interested in coding.*
- *Girl: She is boring*
- *Girl: The video was very specific.*
- *Girl: I am not interested in this career.*
- *Parent: It is enough with what is shown in the video.*
- *Parent: Role model video should focus on positive.*

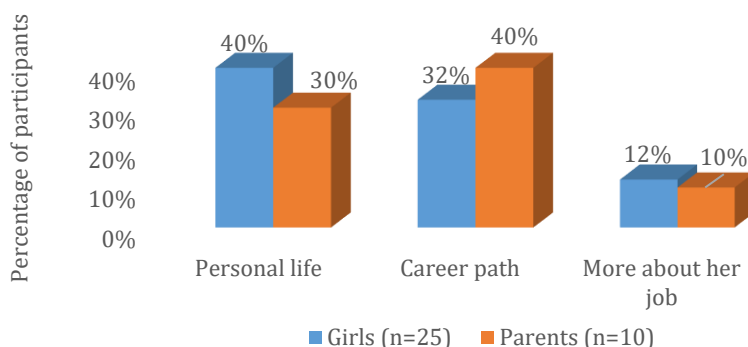
#### **Not sure if interested**

- *Girl: Maybe she doesn't want to share it all and maybe she would.*
- *Girl: She covered everything about it.*
- *Girl: I would be a little interested.*

## 2.5 Other information participants wanted to know about the role model

Finally, participants were invited to suggest anything else they wanted to know about the role model's life or career that they didn't see featured in the video. As shown in Figure 24, among girls and parents who suggested something they wanted to know, the top two themes were questions about the role model's personal life (suggested by two-fifths (40%) of girls and nearly a third (30%) of parents) and how she got into her career (suggested by one-third (32%) of girls and two-fifths (40%) of parents). About one-tenth each of girls (12%) and parents (10%) wanted to know more about her job/career. Examples of their specific comments are also below, with feedback from girls and parents presented together.

**Figure 24. Other information participants wanted about the role model**



### Personal life

- *Girl: How her parents are and what they like about the career her daughter picked.*
- *Girl: I liked to learn more about her family.*
- *Girl: I would like to know more about her life (likes and dislikes)*
- *Girl: More about when she was little.*
- *Parent: Obviously she is single :)*
- *Parent: Will be very interesting to know more about her.*

### Steps to her career

- *Girl: Did she study to become what she is now?*
- *Girl: I think they should have showed more about where she started out in her career after college. Also what sparked her interest in coding.*
- *Girl: I would want to know about how she got into STEM.*
- *Girl: What university she attended and how/why she got there.*
- *Parent: How she became interested in science.*
- *Parent: It would be better seeing what she studied.*
- *Parent: Where she studied and if it's a B.A. or B.S.*

### More about her job

- *Girl: How long has she been in the field.*
- *Girl: How she does her job*
- *Girl: Something I would like to know is if Natalia's job is sometimes stressing.*
- *Parent: More about her career.*

# Summary of findings

## Part 1: Participants' feedback on the rough cut episode *Digital Dance*

**1.1 First words that came to participants' minds to describe how they felt about the episode:** Among girls who shared a response, over one-quarter used the word *interesting*, while more than one-fifth described the episode as *fun* or *entertaining*. More than a tenth each commented on technology, used the words *cool* or *awesome*, described the episode as *boring*, or said it was *creative*. A tenth wrote about being inspired or engaged, and less than a tenth each commented on learning, described the episode as *amazing*, said the episode was *helpful*, mentioned something about the language, or shared miscellaneous comments.

Among parents who shared a response, a third shared miscellaneous comments. One-quarter found the episode *interesting*, and more than a tenth each commented on technology, described the episode as *inspiring* or *engaging*, thought it was *fun* or *entertaining*, found it *boring*, described it as *creative*, commented on learning, or felt it was too long or contained too much information. Less than a tenth each commented on the language or described the episode as *cool* or *awesome*.

**1.2 How appealing participants found the episode:** Overall, girls and parents liked the episode, found it interesting to watch, liked the music featured, felt the episode increased their interest in computer science/coding, and thought they would recommend the episode to friends. Girls tended to rate the episode as somewhat clear, while parents found it clear. Finally, girls were neutral about whether they could relate to the story, while parents found it somewhat relatable.

**1.3 The most interesting things participants felt they learned from the episode:** Among girls who shared a response, nearly three-quarters were most interested in the use of technology in the project. A quarter pointed to something they learned about coding or computer science, and a tenth each commented on something inspiring, the dance, or seeing the SciGirls' passion and how they worked. Less than one-tenth each mentioned learning about the SciGirls and their families, said there was nothing they found interesting, or shared miscellaneous feedback.

Among parents who shared a response, more than a third mentioned the use of technology in the project, while over a quarter pointed to something they learned about coding or computer science. Less than a quarter found it interesting to see the SciGirls' passion or how they worked. More than a tenth each commented on something inspiring, the dance, or shared miscellaneous feedback. Less than a tenth each mentioned learning about the SciGirls and their families or said there was nothing they found interesting.

**1.4 Extent to which participants experienced narrative transportation, story involvement, and character involvement watching the episode**

➤ **1.4a Participants' rating of narrative transportation:** Overall, girls *somewhat agreed* that they were mentally involved in the episode while watching it. They tended to *neither agree nor disagree* that: the technologies in the episode were relevant to their everyday life, that they were thinking about things going on around them while watching the episode, and that they found their mind wandering while watching. They tended to *somewhat disagree* that the episode

affected them emotionally. In summary, the scale findings indicate that girls were more cognitively and attentionally engaged with the story than emotionally engaged.

Overall, parents generally *agreed* that they were mentally involved in the episode while watching it and *somewhat agreed* that the technologies in the episode were relevant to their daughters' everyday life. They *neither agreed nor disagreed* that they were thinking about things going on around them while watching the episode, and *somewhat disagreed* that they found their mind wandering while watching and that the episode affected them emotionally. In summary, the scale findings indicate that, like their daughters, parents were more cognitively and attentionally engaged with the story than emotionally engaged.

- ➔ **1.4b Participants' ratings of story involvement:** Overall, girls tended to *agree* that they cared about seeing the SciGirls' success at the episode's end. They *somewhat agreed-to-agreed* that they were happy the SciGirls figured out how to solve their coding problems. Meanwhile they *somewhat agreed* that: as they watched the episode they wanted to see what technologies and coding the SciGirls would use for the dance; that they wanted to find out how the SciGirls solved their technology and coding problems; and that it was interesting to learn how to code the technologies. They tended to feel *neutral-to-slightly agree* that hearing about the SciGirls' lives pulled them into the story. In summary, the scale findings indicate that the girls were both cognitively and emotionally involved in the progress of the storyline but information about the SciGirls' lives had less affective impact.

Overall, parents *agreed* that: they were happy that the SciGirls figured out how to solve their coding problems; they cared about seeing the girls' success at the episode's end; they wanted to see what technologies and coding the SciGirls would use for the dance; it was interesting to learn how to code the technologies; they wanted to find out how the SciGirls solved their technology and coding problems; and that hearing about the SciGirls' lives pulled them into the story. In summary, the scale findings indicate that parents were more involved in the storyline than their daughters but, like their daughters, parents were comparatively less engaged with the presentation about the SciGirls and their families.

- ➔ **1.4c Participants' ratings of character involvement:** Overall, the girls generally *agreed* that while watching the episode they wanted the SciGirls to reach their goal of adding technology to the dance. They tended to *somewhat agree* that they liked the group of SciGirls in the episode. They tended to *neither agree nor disagree* that while watching the episode, they could feel the SciGirls' emotions, that they felt like they had things in common with the SciGirls, and that the SciGirls and their families are like people they might meet in their neighborhood. In summary, the scale findings indicate that even though the participants liked the SciGirls in the episode, they were fairly neutral about identifying with them personally.

In general, the parents *agreed-to-strongly agreed* that while watching the episode they wanted the SciGirls to reach their goal of adding technology to the dance. They tended to *agree* that they liked the group of SciGirls in the episode and that while watching the episode they could feel the SciGirls' emotions. They tended to *somewhat agree* that the SciGirls and their families are like people they might meet in their neighborhood and that they felt like they had things in common with the SciGirls and their families. In summary, the scale findings indicated that the parents liked the SciGirls and, to a greater extent than their daughters, somewhat agreed that they identified with them personally.

**1.5 Whether participants felt the SciGirls are relatable:** When the girls were asked if they felt they could generally relate to the SciGirls featured in the episode, nearly half said they weren't sure, some of whom went on to explain that they didn't have as much exposure to science and technology compared to the SciGirls. About a third said they could relate to the SciGirls, most often because of shared personal attributes or interest in science projects. A fifth of the girls said they could not relate, most often because they did not "do" coding or digital projects, while a few girls noted they don't speak as much Spanish as the SciGirls did in the episode.

From the parents' perspective, seven-tenths thought their daughters would be able to relate to the SciGirls, in some cases because their daughters liked science and technology, and in other cases because they thought their daughters were similarly creative or curious. A tenth said they didn't think their daughters could relate and one-fifth said they weren't sure. These parents tended to observe that their daughters: weren't interested in technology, don't typically speak Spanish among their friends, are younger or less mature than the SciGirls, and are from different countries than the episode featured.

**1.6 Whether participants felt the SciGirls are good role models:** Nearly all (93%) the girls and all the parents (100%) thought the SciGirls were positive role models for Hispanic girls.

➤ **1.6a Participants' suggestions for how to feature SciGirls as role models:** When asked what the production team could do in the future to ensure that the SciGirls they include are the best possible role models, more than a fifth of girls who shared a response suggested providing more information about the SciGirls' work on the project. More than a tenth each thought the production team should change aspects of the language, suggested producers look for SciGirls with specific personality traits, said they were not sure, or shared miscellaneous comments. A tenth of the girls thought this was well-done as is. Less than a tenth each: suggested including more about technology; remarked on education/learning/ inquiry; thought the SciGirls should be more charismatic or energetic; suggested showing the SciGirls' hobbies, home, and families; or thought the producers should focus on diversity, specifically in the age of SciGirls featured.

Among parents who shared a response, more than a quarter thought this aspect of the episode was well-done. More than one-fifth each suggested specific personality traits or recommended a focus on diversity. More than a tenth each suggested a focus on education/learning/inquiry or shared miscellaneous comments. Smaller groups of less than one-tenth each: suggested showing the SciGirls' hobbies, homes, and families; providing more information about the SciGirls' work on the project; changing aspects of the language; including more information about technology; selecting more charismatic/energetic SciGirls; or said they were not sure.

**1.7 How much participants liked seeing the SciGirls work together and with mentors**

➤ **1.7a How much participants liked seeing the SciGirls work together:** When asked how much they liked seeing the SciGirls work together, the girls and parents both generally indicated that they liked seeing this *a lot*.

➤ **1.7b How much participants liked seeing the SciGirls work with Andrea:** When asked how much they liked seeing the SciGirls work with their mentor Andrea, the girls indicated that they *liked* these interactions, while the parents liked them *a lot*.

- **1.7c How much participants liked seeing the SciGirls work with Daisy:** When asked how much they liked seeing the SciGirls work with their mentor Daisy, the girls generally indicated that they *liked* these interactions, while the parents liked them *a lot*.
- **1.7d Additional feedback participants gave about the SciGirls-mentor relationship:** As presented in Section 1.11a, when participants were asked how good a job the episode did in showing the SciGirls connect with their role models and mentors, overall, the girls indicated the episode did a *good job*, while the parents indicated the episode did an *excellent job* in this regard.

## 1.8 How participants felt about the episode's use of Spanish, Spanglish, and English

- **1.8a How much participants liked that the episode was mostly in Spanish:** When asked to rate how much they liked seeing the episode in Spanish, the girls and the parents both generally indicated they *liked* this aspect of the episode, though parents tended to rate this aspect somewhat higher than did the girls.
- **1.8b How much participants liked seeing the SciGirls talk in Spanglish:** When asked to rate how much they liked seeing the SciGirls talk in Spanglish, the girls and the parents generally indicated they *liked* this aspect of the episode, although parents tended to rate this aspect somewhat higher than did the girls.
- **1.8c How much participants liked seeing the SciGirls being bilingual:** When asked to rate how much they liked seeing the SciGirls being bilingual, overall the parents indicated that they liked this *a lot*, while the girls generally *liked* this aspect of the episode.

**1.9 How participants felt about the episode's focus on the SciGirls' Hispanic cultural background:** About two-thirds of the girls thought the episode's focus on the SciGirls' Hispanic cultural background was about right, while a fifth thought there was too much focus and less than a fifth thought there was too little focus. From the parents' perspective, not quite three-quarters thought the amount of focus on the SciGirls' Hispanic culture was about right, with less than a fifth saying there was too much focus and a tenth saying there was too little focus.

## 1.10 How participants felt about the episode's integration of families in key scenes

- **1.10a How participants felt about the focus on families in the video diaries:** The majority of participants felt that the video diary segments featured the right amount of focus on family members. Specifically, about two-thirds of the girls thought these segments featured the right amount of focus, while less than one-fifth each thought there was too much or too little focus. Meanwhile, from the parents' perspective, nearly two-thirds thought the segments featured the right amount of focus on family members, while a quarter thought there was too much focus and more than one-tenth thought there was too little focus.
- **1.10b How participants felt about the focus on families in the final sharing scene:** About half each of the girls and parents felt the amount of focus on families in the final sharing scene was about right, while nearly half of the parents and one-quarter of the girls felt there should be a greater focus on families. Relatively few girls and parents felt there should be less of a focus.



## 1.11 How participants responded to various aspects of the *SciGirls* project and science process/engineering design scenes

- **1.11a How good a job participants felt the episode did in showing the *SciGirls* work on projects:** Girls and parents both generally rated the episode as doing an *excellent job* of showing the *SciGirls* working together and being creative and unique together. On the remaining ways of participating (asking questions and exploring, not being afraid to make mistakes, connecting with their role models and mentors, motivating others, doing a project that is personally relevant and meaningful, and using STEM to change the world) the girls generally rated the episode as doing a *good job* while the parents rated the episode as doing an *excellent job*.
- **1.11b How participants rated the pace and density and level of the science/ technology:** While girls generally felt the pace of the project/design scenes was about right, parents felt it was slightly too fast. Both girls and parents generally indicated that there was a little too much science/technology in these scenes and that this information was a little too complicated.
- **1.11c Participants' suggestions for what else the project or final share scenes might include:** Participants were asked if there was anything else they would like to see the project or final share segments focus more on. About one-third each of the girls and the parents offered suggestions. Their suggestions most often focused on desiring a greater emphasis on: the process or how the coding project evolved, the mentors and teachers involved in the project, and the *SciGirls*' friends and other students.
- **1.11d Whether participants felt that watching the *SciGirls*' project increased their interest in doing projects:** When the girls were asked if watching the *SciGirls* do their project made them want to try a science/technology project of their own, about two-thirds selected *Yes*, a fifth selected *Not sure*, and less than one-fifth selected *No*. Girls who selected *Yes* were asked what type of project they would like to try. A fifth described wanting to try something like the digital dance, and more than a tenth each wanted to try a coding project or another STEM project. Less than one-tenth each wanted to make a robot or shared miscellaneous comments. Girls who selected *Not sure* were asked why they weren't sure. Less than a tenth each said it looked hard, that they wouldn't know what to do, or expressed uncertainty. Finally, girls who selected *No* were asked why they wouldn't like to try a project on their own. Here, less than one-tenth each said they weren't interested or weren't good at science.

Parents were asked if, after watching, they felt like encouraging their daughters to try a science/technology project on their own or with them. Nearly three-quarters selected *Yes*, about a quarter selected *Not sure*, and one selected *No*. Those who selected *Yes* were asked what type of project they would like their daughter to try and whether it would be on her own or with them. More than a quarter said they would want to work with their daughter, and less than one-tenth suggested she would work on her own. In terms of projects, more than a tenth wanted their daughters to work on other STEM projects, while less than one-tenth each wanted their daughters to try something like the digital dance, said their daughters already did STEM projects, or shared miscellaneous feedback. Those who selected *Not sure* were asked why they weren't sure, with less than a tenth each citing lack of time, daughters' lack of interest, and lack of knowledge. Those who selected *No* were asked why they wouldn't like their daughter to try a project; here, the only parent declined to elaborate.

## Part 2: Participants' feedback on the STEM role model video

**2.1 How appealing participants found the video:** Overall, girls and parents liked the video, found it interesting to watch, liked the music featured, felt the video increased their interest in computer science/coding, and expected they would recommend it to friends.

**2.2 How interesting participants found aspects of the video:** Overall, the girls were *very-to-extremely interested* and the parents were *extremely interested* to hear about the role model's advice for students/girls. The girls were *very interested* and the parents were *extremely interested* to learn about: the role model's occupation; the teacher who encouraged her; her success in her field; and the relevance of STEM to everyday life and future careers. Both girls and parents were generally *very interested* to learn about: the role model's daily routine/life outside of work; how she got interested in STEM/her field; and the challenges she faced and her strategies for overcoming them. Finally, the girls were generally *fairly-to-very interested* while the parents were *extremely interested* to learn about the role model's childhood/what she was like when she was younger.

**2.3 Whether participants felt the featured role model was relatable:** Girls were asked if they felt they could generally relate to the featured role model and her life while parents were asked if they felt their daughters could relate. Nearly nine-tenths of parents compared to two-fifths of girls answered *Yes* to this question. About a third each of girls answered *No* or *Not sure*, while small groups of parents answered *No* or *Not sure*.

**2.4 Whether participants were interested in hearing about challenges or barriers the role model faced:** Participants were asked if they would be interested in hearing more about any challenges or barriers that the role model faced in her career. Three-quarters of parents and more than half of girls reported *Yes*, they were interested. More than a fifth each of girls reported *No* or *Not sure*, while less than a fifth of parents reported *No* and less than a tenth were *Not sure*.

**2.5 Other information participants wanted to know about the role model:** Among girls and parents who shared feedback about things they wanted to know about the role model's life or career that they didn't see featured in the video, the top two themes were questions about the role model's personal life (suggested by two-fifths of girls and nearly a third of parents) and how she got into her career (suggested by one-third of girls and two fifths of parents). About one-tenth each of girls and parents wanted to know more about the role model's job/career.

## Discussion

This formative evaluation of *Latina SciGirls* presents feedback from the project's primary public audiences, Latina girls and their parents.<sup>17</sup> Participants provided feedback on a 25-minute rough cut Spanish-language version of the *Digital Dance* episode and a 3:21-minute Spanish-language STEM role model video.

A review of participants' responses indicates that the *Latina SciGirls* episodes and profile videos have the potential to engage, interest, inform, and motivate Latina girls ages 8-13 and their parents/guardians in the ways envisioned by *tpt*. At the same time, caution should be taken in drawing broad implications from the findings given the inherent goals and limitations of formative evaluations, with the evaluation design in this case relying on a budget-limited sample of 89 participants to provide in-depth feedback for the purpose of informing the development of *SciGirls*, as opposed to providing a full assessment of their impact, as is characteristic of a summative evaluation. Below, we look across the findings at themes that emerge in numerous places to briefly summarize a few issues that might help inform *tpt*'s further development of the television program and profile videos.

### The episode's overall appeal

**Appeal of the episode:** Girls and parents generally liked *Digital Dance*, thought it was interesting, liked the music, felt the episode increased their interest in computer science/coding, and expected they would recommend it to friends. Parents tended to find the episode slightly more clear than did girls and indicated they were somewhat more able to relate to the story.

**Implications:** Other than the findings for character relatability which are further addressed below, the overall appeal of *Digital Dance* among both girls and parents suggests that the *SciGirls* model adapted for producing *Digital Dance* bodes well for the remaining Season Four episodes. Providing further context to the episode's likeability aspect of appeal in particular, a comparison of the *Digital Dance* rough cut with four of the *SciGirls* Season One episodes shows that *Digital Dance* is competitive with appeal ratings in prior seasons. More than four-fifths of girls recruited for the *Digital Dance* evaluation indicated that they *somewhat liked-to-liked* the rough cut episode<sup>18</sup>, while more than four-fifths of girls recruited for the Season One summative evaluation indicated they *liked somewhat* or *liked a lot* the final versions of *High Tech Fashion*, *Puppet Power*, *Going Green*, and *Blowin' in the Wind*.<sup>19 20</sup>

### The episode's portrayal of the SciGirls as likeable, relatable, and good role models

**Whether participants liked the SciGirls and felt they had things in common with them:**

Overall, the girls *somewhat agreed* while the parents *agreed* that they liked the group of SciGirls in the episode. Meanwhile, the girls tended to *neither agree nor disagree* and the parents tended to *somewhat agree* that the SciGirls and their families are like people they might meet in their

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<sup>17</sup> Although the evaluation was open to parents and guardians, only parents ended up participating.

<sup>18</sup> Sharing a rating between 5.0 and 7.0 on a scale from 1.0 (*disliked*) to 7.0 (*liked*).

<sup>19</sup> On a 5-point scale from *disliked a lot* to *liked a lot* with the mid-point being *it was okay*.

<sup>20</sup> Multimedia Research. (2010) Summative Evaluation of *SciGirls* Television Series Season One.

neighborhood. The girls also tended to *neither agree nor disagree* that they had things in common with the SciGirls, while the parents tended to *somewhat agree* that they had things in common with the SciGirls and their families.

**Whether participants felt they could relate to the SciGirls:** The girls were also asked if they felt they could generally relate to the SciGirls featured in the episode, while the parents were asked if they thought their daughters would be able to relate to the SciGirls. One-third of girls and seven-tenths of parents said *Yes*, most often because of shared personal attributes or interest in science projects. However, nearly half of girls and one-fifth of parents said they were *Not sure*, and a fifth of the girls and a tenth of the parents said *No*. Girls and parents who said *No* or *Not sure* tended to observe that they (or their daughters): weren't interested in technology, had less exposure to science and technology than the SciGirls, don't typically speak Spanish among their friends, are younger or less mature than the SciGirls, and are from different countries than the episode featured.

**Whether participants felt the SciGirls were good role models:** Although there were some differences of opinion about the SciGirls' relatability, as noted above, almost all of the participants thought the SciGirls were positive role models. In particular, throughout their surveys, several girls pointed to the importance of the SciGirls' friendships and positive attitudes, noting that these aspects made them relatable role models.

Additionally, when invited to suggest what the production team might do moving forward to ensure that future episodes featured the best possible role models, among girls who offered a suggestion, the largest group, about a fifth, recommended the producers provide more information about the SciGirls' process or work on their project, as in: "*They can show more parts where they struggled so they know that it's not easy but show more parts where they are happy and having fun when they get their task accomplished and casting.*" A slightly smaller group suggested casting SciGirls with specific personality traits, which ranged from "*I think the girls need to be confident, hardworking and persistent*" to "*They can make sure by trying to find girls who are sweet and positive...nice, sweet and talented.*" About a fifth each of the parents who shared a suggestion recommended casting SciGirls with specific personality traits – in this case, recommending SciGirls who are *responsible, creative, intelligent, or respectful* – or they suggested casting SciGirls from diverse cultural backgrounds and countries of origin.

**Implications:** Based on the feedback provided by the participants recruited to view *Digital Dance*, the findings suggest the production team developed *SciGirls* characters who are likable and perceived to be good role models. More attention could be given to reviewing the findings around the SciGirls' relatability, however, to help ensure that girls feel they can relate to and have things in common with the featured SciGirls. This aspect of the series seems particularly important to address given that the production team aims for Hispanic girls and their parents to both identify with the onscreen characters in Season Four and perceive the series to be culturally relevant.

For additional perspective on this issue, note that where participants were asked why they did or did not relate to the SciGirls (or why their daughters would or would not relate), only about a tenth each of girls and parents pointed to cultural issues, while two-fifths of girls and three-tenths of parents commented on technology or coding. Also notable is that nearly a third of girls elsewhere said they thought the episode did a *fair, somewhat poor, or poor* job of showing the girls doing a project they found personally relevant and meaningful. These findings, taken together, suggest that relatability may be more a function of content interest than cultural association,

though both may play a role. To help yield insight on these issues in the future, the production team might consider testing a range of possible projects with girls matching the target audience for content appeal and relevance prior to developing new episodes.

Also for future consideration, supplemental analyses might explore whether the girls who found the SciGirls relatable were more (or less) interested in and/or knowledgeable about computer science/coding prior to watching the rough cut. Similarly, the analyses might also explore the role of other background factors (e.g., girls' age, favorite subject, and viewing language preference) in their experience with the episode. Finally, given that smaller groups of participants thought the SciGirls were relatable, while larger groups thought they were good role models, further evaluation might explore the nature of the relationship between the SciGirls' relatability and their potential impact as role models.

## **The episode's focus on the SciGirls' Hispanic cultural background and families**

**How participants felt about the episode's focus on the SciGirls' Hispanic cultural background:** About two-thirds of the girls and three-quarters of the parents thought the episode's focus on the SciGirls' Hispanic cultural background was about right. These participants most often praised some aspect of the episode's focus on the SciGirls' cultural background, especially the focus on family and the focus on their background and country of origin, including how the episode connected their cultural background to their daily lives. About a fifth each of girls and parents thought there was too much focus on the SciGirls' cultural background, and more than a tenth each of girls and parents thought there was too little focus. Those who felt the episode had too little focus suggested including more examples from the SciGirls' daily lives or more backstory about: their roots, their reasons for liking STEM, and/or their thoughts about how life in America has changed their lives. Among those who felt the episode had too much focus, the few girls and parents who elaborated suggested it focused on too many family members who weren't relevant to the episode.

**How participants felt about the focus on families in the video diaries:** About two-thirds each of the girls and parents thought the SciGirls' video diary segments had the right amount of focus on families. Most often participants liked that the segments: shared personal insights about the SciGirls, showed their everyday lives and unique backgrounds, highlighted the families' pride in and support of the SciGirls, and/or offered a break from the science. Smaller groups of girls and parents thought there was too much focus or too little focus on the families. When invited to elaborate, a few explained that the segments should focus on science rather than families, while others wanted to know more about: the families' lives, their countries of origin, what they do for a living, and how they influenced their daughters, among other topics.

**Whether participants wanted more, less, or the same amount of focus on families in the final sharing scene:** Participants were somewhat divided about whether the final sharing scene should feature families more. While about half each of girls and parents felt this aspect should stay the same, most of the remaining parents wanted families featured more, while the remaining girls were divided between wanting more and wanting less. Though none of the participants commented on why they thought there should be less of a focus on family in this scene and only a few commented on what they liked about the focus as is (as in, "*it was just the right amount*"),

several girls and parents elaborated on why they felt the final share scene could have a greater focus on families, pointing to the importance of family in Hispanic culture, the episode's limited focus on just one family currently, or some other aspect.

**Implications:** Overall, the findings in this section suggest the production team has struck the right balance in weighing how much focus the Season Four episodes should give to the SciGirls' cultural backgrounds. Participants generally appreciated both how much and the way in which *Digital Dance* integrated culture, and they liked seeing the SciGirls share this aspect of their lives. Similarly, as Season Four aims to appeal to both girls and their parents/guardians, the production team seems to have found the right balance in determining how much focus to give family members in the video diary segments, though further consideration might be given to highlighting family more extensively in the final sharing scene, an issue raised by some parents. For further context, note that the about three-quarters of girls and nine-tenth of parents who participated in the *SciGirls* Season Four front-end evaluation felt that the "Backtalk" segments of *Hábitat en Caos* (which were similar to the video diary segments in *Digital Dance*) should feature more family members, while four-fifths of the parents and about half of the girls thought the final sharing scene should incorporate families more.<sup>21</sup>

## How participants responded to various aspects of the *SciGirls*' project and science process/engineering design scenes

**Amount and level of science/technology featured:** Girls and parents generally indicated that there was a little too much science/technology in the design project scenes and that this information was a little too complicated. However, throughout their surveys, several girls and parents said that they would have liked to see *more* science/technology, as in: "*Girl: There should have been a little more explanation behind the coding answering how/why they do things,*" and "*Parent: I think it was too simple.*"

**Most interesting things participants learned:** When asked what they found most interesting about the episode, the largest groups of girls and parents pointed to the technology used in the *SciGirls*' project, while the second largest groups were most interested in the coding or computer science, with other responses being shared less often.

**Involvement with the technology and coding aspects of the project:** The participants also showed they were cognitively and affectively involved with the technology and coding aspects of the project. Girls and parents tended to *agree* that they cared about seeing the *SciGirls*' success at the episode's end. The girls *somewhat agreed-to-agreed* that they were happy the *SciGirls* figured out how to solve their coding problems, while the parents *agreed* that this was the case. Meanwhile the girls *somewhat agreed* and the parents *agreed* that: as they watched the episode they wanted to see what technologies and coding the *SciGirls* would use for the dance, that they wanted to find out how the *SciGirls* solved their technology and coding problems, and that it was interesting to learn how to code the technologies.

**How good a job participants felt the episode did in showing the *SciGirls* work on projects:** Girls and parents both generally rated the episode as doing an *excellent job* of showing the *SciGirls*

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<sup>21</sup> Knight Williams Inc. (2016) *SciGirls* Season Four Front-end Evaluation Report.

working together and being creative and unique together. On the remaining ways of participating that were reflective of the *SciGirls Seven* (asking questions and exploring, not being afraid to make mistakes, connecting with their role models and mentors, motivating others, doing a project that is personally relevant and meaningful, and using STEM to change the world), the girls generally rated the episode as doing a *good job* in each area while the parents rated the episode as doing an *excellent job* in each respect.

**How participants felt about the SciGirls/mentor interactions:** When asked how much they liked seeing the SciGirls work together, both the girls and the parents generally indicated that they liked seeing this *a lot*. Throughout their surveys, participants shared an appreciation for seeing the SciGirls collaborate, bring their individual ideas to the project, and strengthen the dance through teamwork. When asked how much they liked seeing the SciGirls work with their mentors Andrea and Daisy, the girls indicated that they *liked* seeing their interactions with Andrea and Daisy, while the parents liked them *a lot*. Similarly, when asked how good a job the episode did in showing the SciGirls connect with their role models and mentors, the girls indicated the episode did a *good job* in each instance, while the parents indicated the episode did an *excellent job*.

**Motivational impact to do a project:** The girls were also asked if watching the SciGirls do their project made them want to try a science/technology project of their own, while parents were asked if, after watching, they felt like encouraging their daughters to try a project on their own or with them. In each case, the majority of girls and parents said *Yes*, while smaller groups said *No* or *Not sure*.

**Implications:** The findings in this section indicate that the production team successfully engaged viewers in the technology and coding aspects of *Digital Dance*. Both girls and parents expressed interest and involvement in these scenes and indicated a desire to try a science/technology project of their own (or with their daughters). Additionally, the fact that girls and parents most often pointed to the use of technology and computer science/coding as the most interesting things they learned from the episode further indicates the team is successfully communicating the series' STEM content. These findings relating to participants' learning might be another area for further analysis, to help determine the extent to which participants who selected these STEM themes were (or weren't) already interested in and/or knowledgeable about computer science/coding prior to viewing.

Either way, the production team might consider clarifying the episode's science/technology story, and be mindful of this in future episodes, given that many participants felt the project scenes featured *too much* science/technology and in ways they found to be *too complicated*. As one suggestion, throughout their surveys, many girls and parents noted that they enjoyed learning about the possible applications and uses for coding technology, indicating it may be worth incorporating further examples of such applications in the episode to help bridge the lack of perceived relevance to everyday life that some participants expressed and make the science/technology more accessible. (For example: "*Girl: I learned that coding isn't just on the computer. I learned that coding isn't just applied to video games and websites*" and "*Parent: I am always hearing how coding will be such an important part of the future. My girls do not seem interested in programming but both love and excel in Math. I think after seeing this video, coding would peak their interest.*")

The findings in this section also indicate the production team has effectively portrayed the SciGirls/mentor interactions, though some felt the mentors could have had a larger presence in

the episode, as in: “Parent: [Andrea] could have been a little more involved.” and “Girl: I thought Daisy was also a great mentor but I also would have liked to hear her background story and how she got into coding.” Additionally, when asked if there was anything else they would like to see in the project or final share segments, several girls and parents recommended sharing “more on the mentors,” further emphasizing that the production team might consider doing more to showcase SciGirls/mentor relationships and the mentors’ personal lives and career paths in future episodes.

## How participants felt about the episode’s use of Spanish, Spanglish, and English

**Episode’s use of Spanish, Spanglish, and English:** Girls and parents both generally liked the use of Spanish, Spanish, and bilingualism in the episode, though parents tended to rate each aspect somewhat higher than did the girls.

**Implications:** Taking a closer look at the participants’ Spanish and bilingual ratings, note that only a tenth of girls and less than a tenth of parents *somewhat disliked* or *disliked* seeing the SciGirls being bilingual, while most participants offered positive reasons for liking the episode’s use of bilingualism, including that it was *relatable*, *interesting*, *cool*, an *asset* or *door-opener*, an opportunity to highlight Hispanic culture, and/or a way to make the program accessible to both English and Spanish speakers or to those learning one of the two languages. These findings suggest that *tpt* should continue to cast bilingual SciGirls and include examples of their bilingual abilities throughout the episodes.

In comparison, about a fifth of girls and a third of parents indicated that they *disliked* or *somewhat disliked* seeing the episode in Spanish. While few participants directly stated that they disliked the idea of seeing the episode in Spanish, many participants raised issues with *how* the Spanish was spoken in *Digital Dance*, most often observing that the Spanish was *hard to follow* because the featured SciGirls in the episode mispronounced words, used made-up words, mumbled in places, or were otherwise hard to understand. The participating girls, almost all of whom chose to complete their survey in English, tended to raise these issues more than their parents, most often elaborating that although they considered themselves bilingual, they personally felt more *comfortable* with English, noting that English was their *first language* or that it was more *relatable*, and as such they may have been more easily thrown off or confused by the featured SciGirls’ errors.

Some parents also indicated a preference for English. While they tended to raise similar issues to those pointed out by their daughters, a few parents further reflected on their own experience of moving to the U.S. and having a strong conviction to learn English, and to provide opportunities for their children to do the same and use English consistently. Relating to these parents’ comments, note the findings of the Joan Ganz Cooney Center’s recent report on media use in Hispanic-Latino families with young children in the United States, which found that: “*Most bilingual and Spanish-only families...reported that their child learned English from educational media, suggesting that many families can benefit from content that supports English language learning.*”<sup>22</sup> Considering the above, another possible way to address this feedback from parents is to film some portion of the episodes and/or role model videos in English, with Spanish captioning.

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<sup>22</sup> Lee, J. & Baron, B. (2015). *Aprendiendo en casa: Media as a resource for learning among Hispanic-Latino Families*. A report of the Families and Media Project. New York: The Joan Ganz Cooney Center at Sesame Workshop.



Relating further to captioning, several girls and parents suggested that the use of subtitles would help address the issue of their wanting to see more English in the episode, for various reasons, while also helping those who may have trouble understanding the Spanish. These findings suggest the use of English and, in some cases, Spanish captioning to serve the diversity of Hispanic-Latino families – who, in the case of the formative evaluation, cited ten different countries of origin – while also reaching non-Spanish-speaking viewers of past *SciGirls* seasons who have to date only seen the series in English. In sum, keeping the bilingual quality of the girls appears to be important to cultural realism given the goals of Season Four, while captioning seems necessary for appeal, comprehension, and retaining past viewers of *SciGirls* programming.

## The role model video's overall appeal

**Appeal of the role model video:** Overall, girls and parents generally liked the role model video, found it interesting, liked the music, felt the video increased their interest in computer science/coding, and expected they would recommend it to friends.

**Implications:** Overall, the findings suggest that the production team should continue with the approaches used in the role model video for the remaining Season Four videos. As there is no comparable data for prior *SciGirls* role model videos, further evaluation would be needed to determine how these results compare with the appeal ratings of similar videos.

## Portrayal of the role model as relatable, and whether participants liked learning about her life and work

**Whether participants felt they could relate to the role model:** Girls were asked if they felt they could generally relate to the featured role model and her life, while parents were asked if they felt their daughters could relate. Nearly nine-tenths of parents compared to two-fifths of girls answered *Yes* to this question. Among the girls and parents who said *Yes* and elaborated, they most often said that they liked an aspect of the role model's personality (e.g., *talkative, creative, positive*) or that she shared similar interests with the girls. Some also pointed to the fact that she is Latina and a good role model in general, or said they too liked tech/coding. On a related note, throughout their surveys several girls and parents also noted that the role model was "*an example for many Latina to follow.*" About a third each of girls answered *No* or *Not sure*, while small groups of parents answered *No* or *Not sure*. Among girls and parents who said *No* and elaborated, most noted that coding or computer science weren't of interest to the girls or that the role model was considerably older. Among girls and parents who said *Not sure* and elaborated, participants offered the same reasons as those who said *No*, added that they had a *different upbringing*, or said they just didn't know. Together, the participants' responses point to the importance of highlighting the featured role model's relatability through stories about her life and career, while also promoting the relatability (and value) of her work in STEM.

**Whether participants enjoyed learning about the role model:** Overall, the girls were *very-to-extremely interested* and parents *extremely interested* to hear about the role model's advice for students/girls. Overall, girls were *very interested* and parents *extremely interested* to learn about the role model's occupation, the teacher who encouraged her, her success in her field, and the relevance of STEM to everyday life and future careers. Both girls and parents were generally *very interested* to learn about the role model's daily routine/life outside of work, how she got interested in STEM/her field, and her challenges and strategies for overcoming them. Finally, girls

were generally *fairly-to-very interested* while parents were *extremely interested* to learn about her childhood/what she was like when she was younger.

**Implications:** This first Season Four STEM role model video generally appealed to both girls and parents, which bodes well for the remaining Season Four STEM role model videos. The findings suggest that the production team successfully engaged participants to enjoy learning about various aspects of the role model's life and work, though the girls seemed to find the role model somewhat less relatable than parents expected they would. For additional insight on this issue, note that throughout their surveys, some of the girls and parents suggested that they would have liked to know even more about the role model. Among those who shared feedback about additional information they wanted to know about the role model's life or career, the top two themes pointed to participants' interest in her personal life (suggested by two-fifths of girls and a third of parents) and how she got into her career (suggested by a third of girls and two-fifths of parents). About one-tenth each of girls and parents wanted to know more about her job/career.

Similarly, several girls and parents were also open to learning about the challenges the role model faced in her career, with three-quarters of the parents and about half of the girls reporting that they were interested in this topic. When invited to elaborate, most of the girls and parents who said they were interested in hearing about the role model's challenges described this information as *interesting, real, important, relatable, inspiring, and/or motivating*.

If it isn't possible to include this kind of information in future role model videos, *tpt* might consider sharing more about the role models online, for example presenting elements such as photos, expanded biographies, and a curated selection of each role model's work. Role model Natalia Rodriguez's personal website (<http://juxtapoised.com/>), for example, contains a wealth of information about her projects and passions that might be used as a starting point for brainstorming potential additions to the *SciGirls* website.

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