



Formative Evaluation Report Executive Summary

Latina SciGirls

**Rough cut evaluation
Digital Dance episode and STEM role model video**

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Knight Williams Inc.

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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 videos in Spanish and English featuring Latina STEM professionals.

As part of *tpt's* planning for the television program and role model video profiles, the independent evaluation firm Knight Williams Inc. conducted a front-end evaluation focused on gathering input from *Latina SciGirls'* primary public audiences (Hispanic girls and their parents/guardians) and professional audiences (the project's advisors and education partners). A copy of the report on this work can be found on the [tpt STEM evaluations site](#).

The independent evaluation team subsequently undertook a formative evaluation 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. This executive summary presents highlights from the formative evaluation findings in two parts. Part 1 focuses on findings related to a rough cut episode, including its overall appeal, portrayal of the featured *SciGirls* and their Hispanic culture and family, depiction of the project and science process/engineering design scenes, and use of Spanish, Spanglish, and English. Part 2 focuses on findings related to a role model video, including its overall appeal and portrayal of the role model featured.

Method

Procedure: 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 team recruited independent samples of girls and parents in four sites (Sacramento, CA; Nashville, TN; Princeton, NJ; and Miami, FL) 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. The recruiting criteria further required that the girls be bilingual and that their parents be from diverse countries of origin. The evaluation sessions were held in community center settings during which participants completed pre- and post-viewing questionnaires and took part in brief follow-up discussions to gather additional feedback about the episode and role model video.

Analysis: Basic descriptive statistics were performed on the quantitative data generated from the evaluation. Content analyses were performed on the qualitative data generated in the open-ended questions. The analysis was both deductive, drawing on the *Latina SciGirls* goals and objectives, and inductive, looking for overall themes, keywords, and key phrases. Where scales are presented, mean ratings are provided. Otherwise, where items in a set of questions do not comprise a scale but represent a list of distinct viewing goals developed for the series, individual median ratings are provided.

Participant information

Among the 89 participants in the *Latina SciGirls* formative evaluation, 54 were youth and 35 were parents. All (100%) of the youth and three-quarters (74%) of the parents were female. 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. 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%). All of the girls, meanwhile, were second-generation English speakers born in the U.S. It is estimated, though not confirmed, that at least half, and likely more, of the girls participated in English Language Learning programs. All of the girls (100%) and about half of the parents (49%) chose to complete the surveys in English rather than Spanish.

None of the parents (0%) worked in a STEM field, with most describing work that involved either house cleaning or office, grocery store, restaurant, or day care work. Prior to seeing the episode, the girls most often described their favorite subjects as science (32%), math (28%), and language arts (25%), followed by social studies (8%), technology (2%), and physical education (2%). 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 (the subject of the rough cut and role model video). More than half (54%) of the girls and two-thirds (66%) of the parents reported they were somewhat or very interested in computer science or coding. Finally, none of the parents had previously seen any *SciGirls* television shows or videos, although a small number (4%) of girls had.

Part 1: Feedback about the *Digital Dance* episode

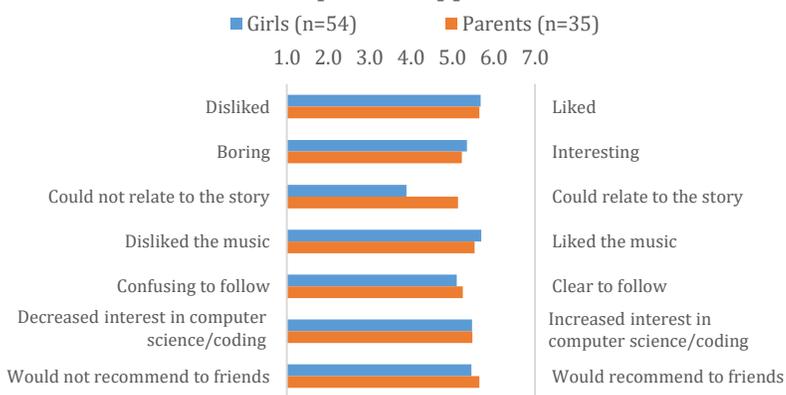
This section provides an overview of key findings relating to the episode's: overall appeal, portrayal of the featured SciGirls and their Hispanic culture and family, depiction of the project and science process/engineering design scenes, and use of Spanish, Spanglish, and English.

The episode's overall appeal

Overall, participants found the episode appealing. Both girls and parents generally liked the episode and accompanying music, thought the episode was interesting, felt it increased their interest in computer science/coding, and expected they'd recommend it to friends. Parents tended to find the episode a little clearer to follow than did girls and indicated they were somewhat more able to relate to the story.

Appeal of the episode: Participants were asked to rate aspects of the appeal of *Digital Dance* using a scale from 1.0 (rated the lowest) to 7.0 (rated the highest) in each case. Based on the seven indicators of appeal shown in Figure 1, the overall scale means show that girls and parents generally found the episode appealing (Girls: $M = 5.2$, $SD = 1.07$; Parents: $M = 5.4$, $SD = 1.34$).¹ Specifically, girls and parents generally liked the episode, found it interesting, liked the music, felt the episode increased their interest in computer science/coding, and

Figure 1. Participants' mean ratings of the episode's appeal



¹ Cronbach's alpha for this seven-item scale is as follows: Girls $\alpha = .71$, 95% CI [.57, .81]; Parents $\alpha = .91$, 95% CI [.86, .95].

thought they would recommend it to friends. Girls tended to rate the episode as somewhat clear, while parents found it slightly more clear. Finally, girls were neutral about whether they could relate to the story, while parents felt they could somewhat relate.²

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 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 (83%) of girls recruited for the *Digital Dance* evaluation indicated that they *somewhat liked-to-liked* the rough cut episode (sharing a rating of 5.0 – 7.0) 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* (95%), *Puppet Power* (95%), *Going Green* (85%), and *Blowin’ in the Wind* (83%).^{3 4}

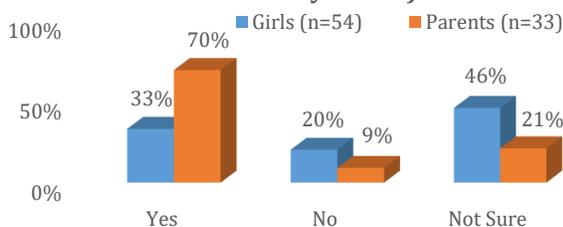
The episode’s portrayal of the SciGirls as likeable, relatable, and good role models

Though participants generally liked the SciGirls and thought they were good role models, girls seemed to find the SciGirls somewhat less relatable than their parents expected they would. Girls also seemed to feel they had less in common with the SciGirls and their families than did their parents.

Whether participants liked the SciGirls and felt they had things in common with them: When asked to indicate their level of agreement with statements presented as part of a scale about the *SciGirls* characters on a scale from 1.0 (*strongly disagree*) to 7.0 (*strongly agree*) each, girls tended to *somewhat agree* while parents tended to *agree* that they liked the group of *SciGirls* in the episode.⁵ Meanwhile, the girls tended to *neither agree nor disagree* and parents tended to *somewhat agree* that the *SciGirls* and their families are like people they might meet in their neighborhood.⁶ Similarly, girls tended to *neither agree nor disagree* that they had things in common with the *SciGirls*, while parents tended to *somewhat agree* that they had things in common with the *SciGirls* and their families.⁷

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*. As shown in Figure 2, one-third (33%) of girls and seven-tenths (70%) of parents said *Yes*, most

Figure 2. Whether girls could relate to the *SciGirls* (and whether their parents expected they would)



² Mean ratings and standard deviations are as follows: disliked-liked (Girls: $M = 5.7, SD = 1.51$; Parents: $M = 5.7, SD = 1.39$); boring-interesting (Girls: $M = 5.4, SD = 2.05$; Parents: $M = 5.2, SD = 1.93$); disliked-liked music (Girls: $M = 5.7, SD = 1.46$; Parents: $M = 5.5, SD = 1.59$); decreased-increased interest in computer science/coding (Girls: $M = 5.5, SD = 1.79$; Parents: $M = 5.5, SD = 1.79$); wouldn’t-would recommend episode to friends (Girls: $M = 5.5, SD = 1.78$; Parents: $M = 5.7, SD = 1.85$); confusing-clear (Girls: $M = 5.1, SD = 1.93$; Parents: $M = 5.3, SD = 1.67$); couldn’t-could relate to story (Girls: $M = 3.9, SD = 1.85$; Parents: $M = 5.1, SD = 1.57$).

³ On a 5-point scale from *disliked a lot* to *liked a lot* with the mid-point being *it was okay*.

⁴ Multimedia Research. (2010) Summative Evaluation of *SciGirls* Television Series Season One.

⁵ Girls: $M = 5.4, SD = 1.83$; Parents: $M = 6.1, SD = 1.29$

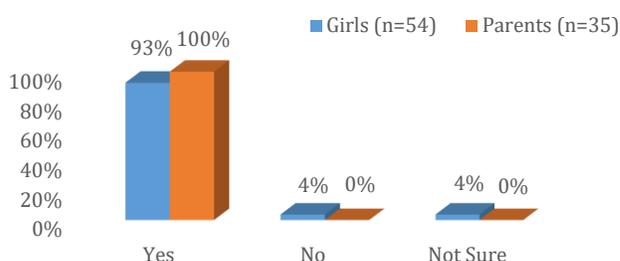
⁶ Girls: $M = 3.6, SD = 2.09$; Parents: $M = 5.2, SD = 1.97$

⁷ Girls: $M = 4.1, SD = 1.86$; Parents: $M = 5.3, SD = 1.69$

often because of shared personal attributes or interest in science projects. However, nearly half (46%) of girls and one-fifth (21%) of parents said they were *Not sure*, and a fifth (20%) of girls and a tenth (9%) of 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, nearly all (93%) of the girls and all (100%) of the parents thought the SciGirls were positive role models, as shown in Figure 3. 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.

Figure 3. Whether participants felt the SciGirls were positive role models



Additionally, when invited to suggest what the production team might do moving forward to ensure that future episodes feature the best possible role models, among the 49 girls who offered a suggestion, the largest group (22%) 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 (16%) 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.*" The 27 parents who shared a suggestion most often recommended casting SciGirls with specific personality traits (22%), in this case, recommending girls who are *responsible, creative, intelligent, or respectful*, or they suggested casting girls from diverse cultural backgrounds and countries of origin (22%).

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 girl viewers 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 inform future production decisions surrounding this issue, 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.

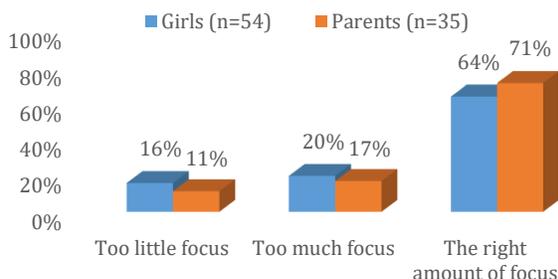
Also for future consideration, supplemental analyses might explore whether the girls who found the SciGirls relatable were more (or less) interested in and/or knowledgeable about computer science/coding prior to watching the rough cut. Similarly, the analyses might also explore the role of other background factors (e.g., girls' age, favorite subject, and viewing language preference) in girls' 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

The majority of girls and parents thought the episode gave the right amount of focus to the SciGirls' Hispanic cultural background and that the video diary segments gave about the right amount of focus to the SciGirls' families. Participants were somewhat divided about whether the final sharing scene should feature families more. While about half of participants 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.

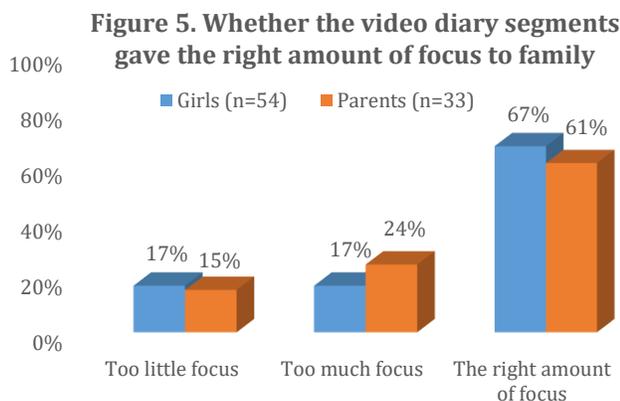
How participants felt about the episode's focus on the SciGirls' Hispanic cultural background: As shown in Figure 4, about two-thirds (64%) of the girls and three-quarters (71%) of the parents thought the episode's focus on the SciGirls' Hispanic cultural background was about right. These participants 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. A fifth each of girls (20%) and parents (17%) thought there was too much focus on the SciGirls' cultural background, and more than a tenth each of girls (16%) and parents (11%) 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.

Figure 4. Whether the episode gave the right amount of focus to the SciGirls' cultural background



How participants felt about the focus on families in the video diaries:

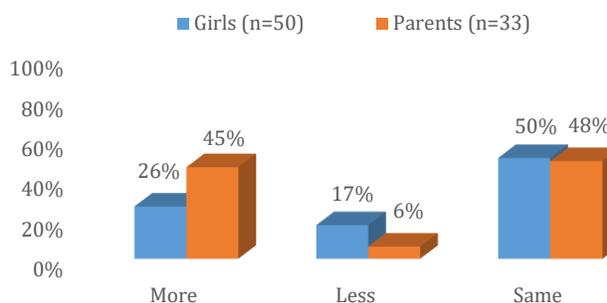
As shown in Figure 5, about two-thirds each of the girls (67%) and parents (61%) thought the SciGirls' video diary segments had the right amount of focus on families. Most often participants liked that the segments: shared personal insights about the SciGirls, showed their everyday lives and unique backgrounds, 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 (Girls: 17%; Parents: 24%) or too little focus (Girls: 17%; Parents: 15%) 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:

Additionally, as shown in Figure 6, about half each of the girls (50%) and parents (48%) felt the final sharing scene featured the right amount of focus on family members. 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. 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 in, "it was just the right amount"), several girls and parents elaborated on why they felt the final sharing 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 of the segment.

Figure 6. Whether final sharing scene should show families more, less, or the same amount



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 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 majority of girls and 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 (Girls: 72%; Parents: 90%), while four-fifths (82%) of the parents and about half (52%) of the girls thought the final sharing scene should incorporate families more.⁸

⁸ Knight Williams Inc. (2016) *SciGirls* Season Four Front-end Evaluation Report.

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

Overall, participants felt the design project scenes had a little too much science/technology and that this information was a little too complicated. However, many girls and parents expressed interest (and high involvement) 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). Participants generally liked seeing *SciGirls'* mentor interactions, though some felt the mentors could have had a larger presence in the episode.

Amount and level of science/technology featured: When asked to rate the design project scenes in terms of 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, girls and parents generally indicated that there was a little too much science/technology in these scenes ($Mdn = 5.0$ each) and that this information was a little too complicated ($Mdn = 5.0$ each). However, throughout their surveys, several girls and parents explained that they would have liked to see *more* science/technology in the episode, 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 to describe what they found most interesting about the episode, the largest groups of girls (73%) and parents (36%) pointed to the technology used in the *SciGirls'* project, while the second largest groups of girls (25%) and parents (28%) 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, based on their level of agreement with a series of statements relating to the episode’s coding project on a scale from 1.0 (*strongly disagree*) to 7.0 (*strongly agree*) each. The girls and parents tended to *agree* that they cared about seeing the *SciGirls'* success at the episode’s end.⁹ 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.¹⁰ 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 dance¹¹, that they wanted to find out how the *SciGirls* solved their technology and coding problems¹², and that it was interesting to learn how to code the technologies.¹³

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*) each. As shown in Figure 7 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

⁹ Girls: $M = 5.6, SD = 1.78$; Parents: $M = 6.5, SD = .85$

¹⁰ Girls: $M = 5.5, SD = 1.66$; Parents: $M = 6.3, SD = .98$

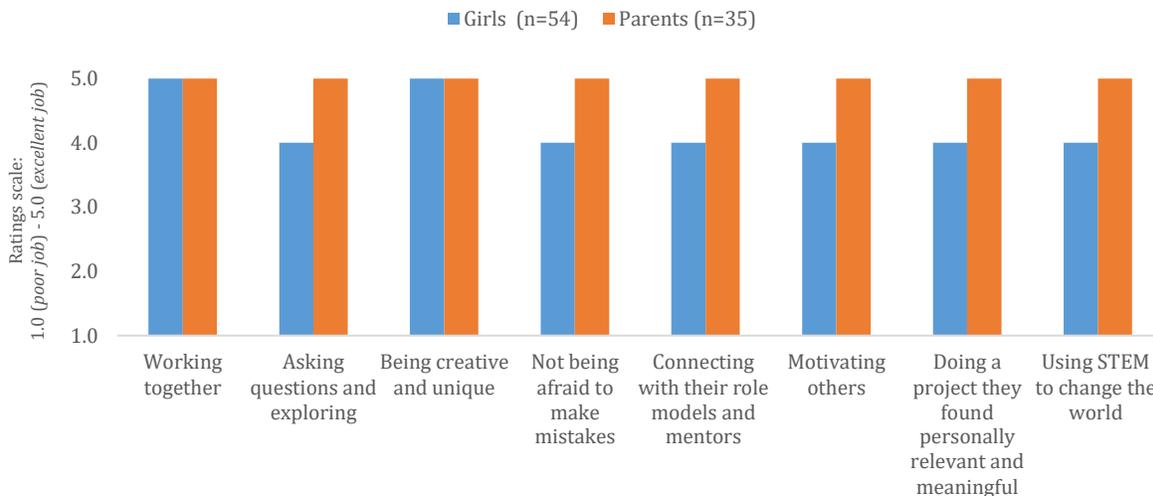
¹¹ Girls: $M = 5.1, SD = 1.94$; Parents: $M = 5.9, SD = 1.10$

¹² Girls: $M = 5.1, SD = 1.78$; Parents: $M = 5.7, SD = 1.17$

¹³ Girls: $M = 5.4, SD = 1.85$; Parents: $M = 5.9, SD = 1.11$

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).

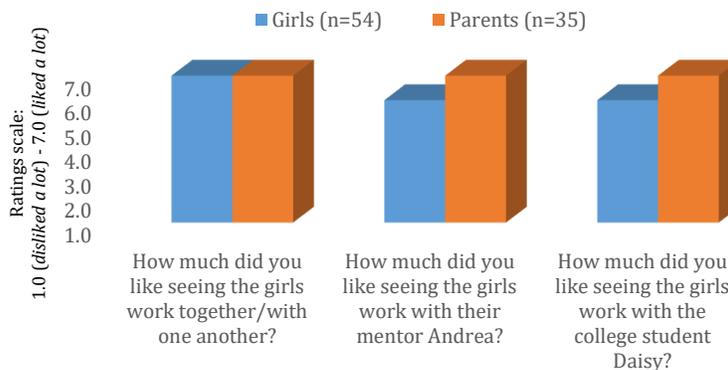
Figure 7. Participants' median ratings of how good a job the episode did in showing the SciGirls participate in ways reflective of the *SciGirls Seven*



How participants felt about the SciGirls/mentor interactions:

As shown in Figure 8, 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*), girls and parents both 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.

Figure 8. Median ratings of how much participants liked seeing the SciGirls work together and with their mentors



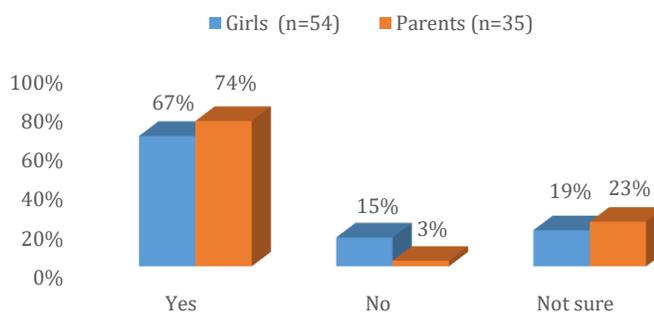
When asked how much they liked seeing the SciGirls work with their mentors Andrea and Daisy on a scale from 1.0 (*disliked a lot*) to 7.0 (*liked a lot*) each, the girls indicated that they *liked* seeing their interactions with Andrea and Daisy (*Mdn* = 6.0 each), while the parents liked them *a lot* (*Mdn* = 7.0 each). Similarly, elsewhere in the evaluation, participants were also 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) in this regard, while the parents indicated the episode did an *excellent job* (*Mdn* = 5.0).

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 science/technology project on their own or with them. As shown in Figure 9, in each case, the majority of girls (67%) and parents (74%) said *Yes*, while smaller groups said *No* (Girls: 15%; Parents: 3%) or *Not sure* (Girls: 19%; Parents 23%).

Figure 9. Whether girls felt watching the SciGirls do their project made them want to try their own

(and whether parents felt like it encouraged them to help their daughters do a STEM project)



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 learning findings might be another area for further analysis to help determine the extent to which participants who selected 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.

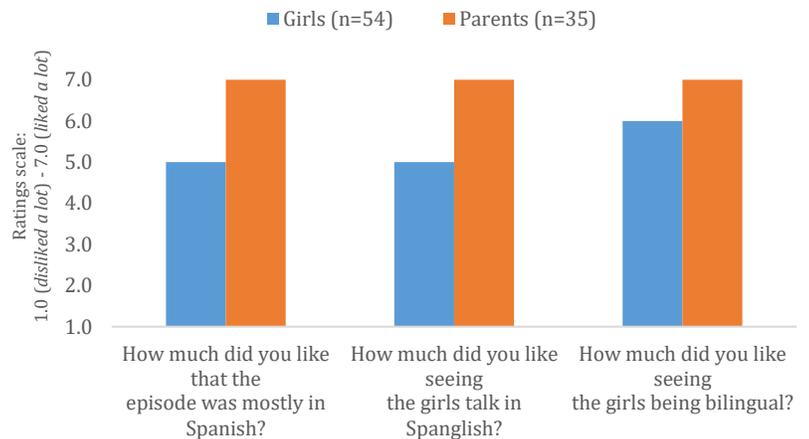
How participants felt about the episode's use of Spanish, Spanglish, and English

Although participants generally liked the use of Spanish, Spanglish, and bilingualism in the episode, some girls and parents pointed to the value of adding captions.

Episode's use of Spanish, Spanglish, and English:

Girls and parents were asked to rate how much they liked the episode's use of Spanish, Spanglish, and bilingualism on a scale from 1.0 (*disliked a lot*) to 7.0 (*liked a lot*) each, with 4.0 being neutral in each case. As shown in Figure 10, participants generally indicated they liked the use of Spanish, though parents tended to rate it somewhat higher than did the girls ($Mdn = 7.0$ vs. 5.0). Both groups also generally liked the use of Spanglish, though here as well parents tended to rate this aspect somewhat higher than did the girls ($Mdn = 7.0$ vs. 5.0). Finally, parents generally indicated that they liked the use of bilingualism *a lot* ($Mdn = 7.0$), while the girls generally *liked* this aspect of the episode ($Mdn = 6.0$).

Figure 10. Median ratings of how much participants liked or disliked the episode's use of Spanish, Spanglish, and bilingualism



Implications: Taking a closer look at the participants' Spanish and bilingual ratings, note that only small groups of girls (10%) and parents (6%) *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 (21%) of girls and a third (30%) 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.”¹⁴ 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.

Relating further to captioning, several participants, both 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 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.

Part 2: Feedback about the role model video

This section provides an overview of key findings relating to the role model video’s overall appeal and portrayal of the role model.

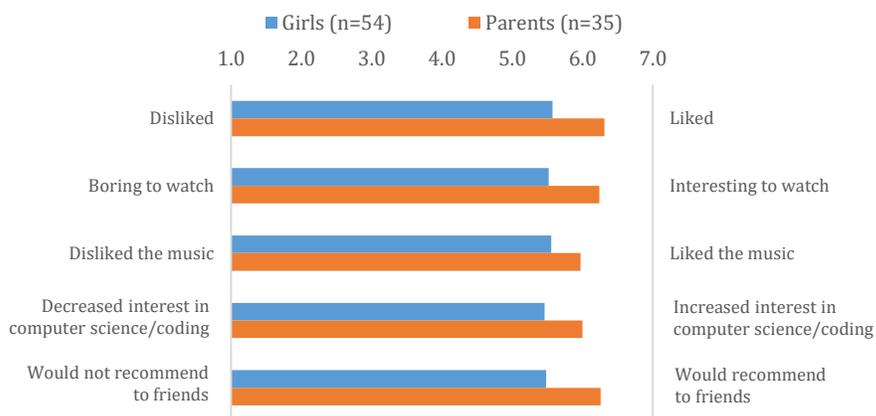
The role model video’s overall appeal

Overall, participants found the role model video appealing. Both girls and parents generally liked the 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.

Appeal of the role model video:

Participants were asked to rate aspects of the appeal of the role model video using a scale from 1.0 (rated the lowest) to 7.0 (rated the highest) in each case. Based on the five indicators of appeal shown in Figure 11, the overall scale means show that 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: $M = 6.1$, $SD = 1.01$).¹⁵ Specifically, girls and parents liked the video, found it

Figure 11. Participants’ mean appeal ratings of the STEM role model video



¹⁴ 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.

¹⁵ Cronbach’s alpha for this five-item scale is as follows: Girls $\alpha = .90$, 95% CI [.85, .94]; Parents $\alpha = .92$, 95% CI [.88, .96].

interesting, liked the music, felt the video increased their interest in computer science/coding, and expected they would recommend it to friends.¹⁶

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

Though participants enjoyed learning about various aspects of the role model's life and work, girls seemed to find the role model somewhat less relatable than parents expected they would.

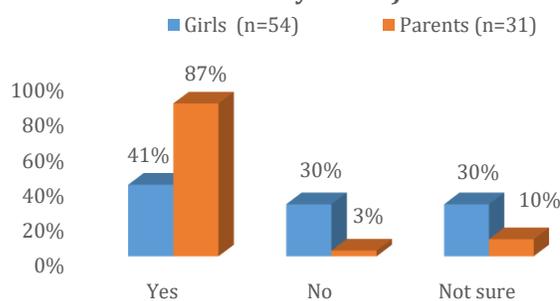
Whether participants felt they could relate to the role model:

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. As shown in Figure 12, nearly nine-tenths (87%) of parents compared to two-fifths (41%) 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.*" Remaining girls answered *No* (30%) or *Not sure* (30%) and remaining parents answered *No* (3%) or *Not sure* (10%).

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: Participants were asked to rate how interesting they found learning (or hearing) about several aspects of the role model's life, using the scale from 1.0 (*not interesting*) to 5.0 (*extremely interesting*) in each case. Overall, the 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

Figure 12. Whether girls could relate to the role model (and whether parents expected they would)



¹⁶ Mean ratings and standard deviations are as follows: disliked-liked (Girls: $M = 5.6, SD = 1.81$; Parents: $M = 6.3, SD = 1.08$); boring-interesting (Girls: $M = 5.5, SD = 1.86$; Parents: $M = 6.2, SD = 1.36$); disliked-liked music (Girls: $M = 5.6, SD = 1.35$; Parents: $M = 6.0, SD = 1.35$); decreased-increased interest in computer science/coding (Girls: $M = 5.5, SD = 1.82$; Parents: $M = 6.0, SD = 1.26$); wouldn't-would recommend episode to friends (Girls: $M = 5.5, SD = 1.87$; Parents: $M = 6.3, SD = 1.15$).

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.

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 40% of girls and 30% of parents) and how she got into her career (suggested by 32% of girls and 40% of parents). About one-tenth each of girls (12%) and parents (10%) 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 (75%) of the parents and about half (54%) 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.