Exploring Latino Parent Attitudes Toward Science and Involvement in their Children’s Science Education

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Hispanic/Latino population underrepresented in Science, Technology, Engineering, and Mathematics in 2015
Why is it important to have diversity in STEM Fields?

• Guards against groupthink and overconfidence
• Improves ability to solve problems and make predictions

(Janis, 1972; Alpert & Raiffa, 1982; Brodock & Massam, 2016; Tachibana, 2012; Page, 2007)
Children’s Interest in Science—Earlier the Better

• More likely to pursue science in college

• Children spend most of their time with parents and family

• Home experiences affect interest in science

(Sha, Schunn, Bathgate, and Ben-Eliyahu, 2016)
Positive Influences on Children’s Interest in Science

Informal Science Education

Parental Involvement

Parental Attitudes

Increased Interest in Science

(Bruyere, 2010; Rochin and Mello, 2007; Dewitt, Osborne, Archer, Dillon, Willis, and Wong, 2013; Kaya and Lundeen, 2010)
Factors that Decrease Parental Involvement

- Lack of Parental Involvement
  - Negative Perceptions of Science
    - Low Knowledge of Science Concepts
    - Lack of Educational Resources

(Castaneda, 2006; Kaya and Lundeen, 2010; Perera, 2014)
Exploratory Questions

• How are Latino parental attitudes of science influenced after participating in a family science event?
Exploratory Questions

• How are Latino parental attitudes of science influenced after participating in a family science event?

• What are Latino parents’ perceptions regarding the value of family science events?
Exploratory Questions

• How are Latino parental attitudes of science influenced after participating in a family science event?
• What are Latino parents’ perceptions regarding the value of family science events?
• How is Latino parental involvement influenced after a family science event?
## Attitude Toward Science Survey

<table>
<thead>
<tr>
<th></th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Undecided</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Science is fun.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. I do not like science and it bothers me to have to study it.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. During science events, I usually am interested.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. I would like to learn more about science.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. If I knew I would never go to science events again, I would feel sad.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. Science is interesting to me and I enjoy it.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>7. Science makes me feel uncomfortable, restless, irritable, and impatient.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>8. For this question, fill in 'Undecided'.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>9. Science is fascinating and fun.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>10. The feeling that I have towards science is a good feeling.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>11. When I hear the word science, I have a feeling of dislike.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>12. Science is a topic which I enjoy studying.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>13. I feel at ease with science and I like it very much.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>14. I feel a definite positive reaction to science.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>15. Science is boring.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

(Germann, 1988)
## Family Science Event Survey

<table>
<thead>
<tr>
<th>Question</th>
<th>Strongly agree</th>
<th>Agree</th>
<th>Neutral</th>
<th>Disagree</th>
<th>Strongly disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. This experience was valuable for my child.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>2. This experience was valuable for me.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>3. This experience made me less comfortable doing science.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>4. I believe that teaching hands-on science is beneficial to my child.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>5. I am interested in assisting my child’s class or school with science.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>6. I am willing to volunteer with the family science initiative.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>7. This experience made me more comfortable doing science.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
<tr>
<td>8. I liked science when I was in elementary school.</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
<td>○</td>
</tr>
</tbody>
</table>

(Kaya & Lundeen, 2010)
Parent Involvement Questionnaire

1. What ways are you involved with your child in science activities? Please explain.

2. What ways do you have conversations with your child about science? And how often? Please explain.

3. How comfortable are you doing science with your child? Please explain.

4. What sorts of things might help you feel more comfortable doing science as a parent/guardian? Please explain.

5. In what ways, if any, are you involved in the science being taught at your child’s school? Please explain.

6. What is the biggest obstacle, if any, that prevents you from getting more involved in your child’s science education? What might be able to help you overcome this obstacle? Please explain.

(Bahena, Schueler, McIntyre, & Gehlbach, 2016)
Family Science Activities

Balloon Rocket

Eclipse Viewers

Photos: San Marcos Daily Record
Study Sites

- Allen Woods Homes
- Centro Cultural Hispano de San Marcos
- San Marcos Public Library
Attitude Toward Science by Race/Ethnicity (n=9)

- Hispanic/Latino (5) 62.2%
- Asian/Pacific Islander (1) 55%
- Caucasian/White (2) 70%
- Biracial (1) 57%

Library Program by Race/Ethnicity (n=9)

- Hispanic/Latino (5) 11.11%
- Asian/Pacific Islander (1) 22.22%
- Caucasian/White (2) 55.56%
- Biracial (1) 11.11%
Attitude Toward Science by Race/Ethnicity (n=4)

- Hispanic/Latino (1): 61 Positive, 65 Negative
- Hispanic/Latino (2): 65 Positive, 66 Negative
- Hispanic/Latino (3): 52 Positive, 53 Negative
- Asian/Pacific Islander (4): 66 Positive, 66 Negative

Allen Woods Homes Program by Race/Ethnicity (n=4)

- Hispanic/Latino (3) 25%
- Asian/Pacific Islander (1) 75%
Attitude Toward Science by Race/Ethnicity (n=5)

- Hispanic/Latino (1) 59 63
- Hispanic/Latino (2) 59 60
- Hispanic/Latino (3) 67 68
- Hispanic/Latino (4) 70 70
- Asian/Pacific Islander (5) 61 66

Centro Program by Race/Ethnicity (n=6)

- Hispanic/Latino (4) 33.33%
- Asian/Pacific Islander (2) 66.67%
“...this program has helped me in my own understanding of science, that it doesn’t have to be complicated with lots [of] complicated equipment...”
Case Study Parent #2 - Jessica

“... simple projects are fun. We really enjoyed the activities we did with the solar beads.” - Jessica
Parent Perceptions of Family Science Event

Parent Perceptions of Family Science Event (n=9)

Hispanic/Latino (7)

Asian/Pacific Islander (2)

Race/Ethnicity

Positive

Negative

Allen Woods & Centro Cultural

Photo: Allen Woods Homes
Parental Involvement

Most Types of Involvement:
- Talking About Science
- Informal Science Events
- Home Projects

Least Types of Involvement:
- Child’s School

Comfort Level Doing Science:
- Comfortable Doing Science

Educational Resources
Challenges to Study

• Gaining participation from parents that are not interested in science

• Encouraging parents to continually return
Increases in Latino parents’ attitudes towards science

Positive perceptions of our family science events

Latino parents need access to educational resources
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San Marcos Daily Record

Volunteers
Enrique Aguayo
Rodrigo Aguayo
Carlos Baca
Brandy Gaytan
Veronica Molina
Lindsay Ogan
Geovanny Orduna-Loya
Sydney Robinett
Robert Shine

Photo: San Marcos Daily Record
Questions?

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