



# CALIFORNIA STATE SCIENCE FAIR 2012 PROJECT SUMMARY

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| <b>Name(s)</b><br>Shira J. Kahn-Samuelson  | <b>Project Number</b><br><b>J0411</b> |
| <b>Project Title</b><br><b>Can Children Perceive If Their Peers Are Truly Smiling?</b>   |                                       |
| <p style="text-align: center;"><b>Abstract</b></p> <p><b>Objectives/Goals</b><br/>The objective is to see if children can perceive the difference between Duchenne (real) smiles and fake smiles in other children. Additional goals were to determine if there was a difference in perception between boys and girls, and if there were differences in perception between children with opposite gender siblings versus those without.</p> <p><b>Methods/Materials</b><br/>Informed consent was obtained from the parents of 56 randomly chosen children, 30 girls and 26 boys ages 8-13 years. The children were shown 20 pictures of children equally divided by gender and by Duchenne and fake smiles. A picture of a child with their face in a neutral expression was shown before a picture of the same child was shown smiling. After each photo the subject was asked to circle "happy", "not happy", or "I do not know". The "I do not know" option was counted as wrong and used to eliminate guessing. Before seeing the photos, subjects filled out a questionnaire asking the subject's gender, age, and the number, ages, and gender of their siblings. Microsoft Excel was used to summarize the data and calculate the success rate, kappa value, and 95% confidence intervals. The control group used for comparison was the results that would have been obtained from random guessing.</p> <p><b>Results</b><br/>The data established with statistical significance that children were able to differentiate Duchenne from fake smiles, as the result from guessing was outside the 95% confidence interval. There was no statistically significant difference between girls and boys, or girls with brothers versus girls without brothers. Boys without sisters was almost significantly worse than boys with sisters and the lower 95% confidence limit was only slightly better than random chance.</p> <p><b>Conclusions/Discussion</b><br/>Children are able to differentiate Duchenne smiles from fake smiles. Boys without sisters scored the lowest overall, and were nearly statistically different than boys with sisters and barely statistically different than random chance. Boys without sisters may be at a social disadvantage because of their inability to perceive Duchenne smiles. Since the confidence intervals for the boy groups barely over-lapped further research with a larger sample size is warranted. Another potential area of research is whether children who are home-schooled are less able to differentiate Duchenne from fake smiles than children who attend school.</p> |                                       |
| <b>Summary Statement</b><br>In this experiment different groups of children were tested to see if they were able to perceive differences between Duchenne and fake smiles in other children.   |                                       |
| <b>Help Received</b><br>Mother proofread research paper and abstract; Father mentored statistical analysis, provided Excel software for data analysis, confirmed data analysis and reviewed charts.  |                                       |