UCLA Undergraduate Research Center
Humanities, Arts, and Social Sciences

# Creating a Research Poster

## What is a Research Poster?

A research poster is an organized, visual display of the main points of your research or creative project. Typically, you present your poster in a poster session at a conference or seminar. Conference or seminar attendees will walk by your poster, study its contents, and ask you questions. You should be prepared to answer questions and to explain your project one-on-one frequently throughout the poster session.

To put it simply, a research poster is:

- A way to summarize and visualize your own research or creative work on a single large display
- Your opportunity to capture and convey the main points of your research to your audience

How you design your poster is up to you! Guidelines are offered to help you think about different aspects and the process of creating a poster for your research.

## Who will see it and read it?

Your audience will depend on the context of the poster event. Generally, the audience is an assortment of colleagues, classmates, mentors, professors, and professionals as well as leaders in your field or a related field.

People walking by may glance at your poster, stop for a few minutes, or stop longer to hear you present, and some may ask you questions. An effective audience-friendly poster:

- **Presents your research in an organized and visually pleasing way.** Posters typically contain both text and graphics (charts, tables, lists, etc.).
- **Is self-explanatory.** In the case that you aren't standing by your poster, or if you are otherwise engaged in conversation, anyone walking by should be able to view your poster and understand the main points of your project.
- **Is easy to read.** Be sure your text and graphics are large enough that multiple people standing a few feet away can read your poster simultaneously.
- **Is concise.** Your poster should summarize your project quickly and efficiently. Avoid long paragraphs. Bullet points are often very effective. Figure out how you might present parts of your project through graphics. You should be able to explain your poster from start to finish in fifteen to twenty minutes, OR those who are reading it should be able to gather the main points in less than five minutes.

## Undergraduate Research Week (May 20-24, 2019)

Undergraduate Research Week showcases undergraduate research and creative projects in the humanities, arts, social sciences, life sciences, physical sciences, and engineering. Events include oral presentations of student research, and presentations of research posters on Poster Day. **Applications are due April 15** – share your research or creative project at an interdisciplinary conference!

### Presenting Your Poster – a few suggestions

- Wear business casual attire. Wear comfortable shoes as you will be standing for long periods.
- Plan a few versions of your presentation that can be given in 1-2 minutes and 2-5 minutes in length to accompany your poster.
- Your verbal presentation should align with your visual presentation. You shouldn't be jumping inconsistently across your poster.
- Be prepared for frequent interruptions. Viewers will ask you questions as you go along. They do not wait until the end of your presentation.
- Face your audience when speaking, but point to your poster.
- Start with the big picture. Emphasize your project goal. Walk the viewer through all the panels on your poster. Make sure that you end with a take-home message that brings the viewer back to your big picture.
- Remember: If it is on your poster, you should be prepared to talk about it.

### Posters for Research Week

- Your poster can be sized **up to 42 inches wide by 42 inches tall.**
- Your poster will be attached to a poster board with pins provided by the Undergraduate Research Center on Research Poster Day.
- You can make a poster in PowerPoint and print it as a poster.
- Posters can be printed at UCLA or at a local printer. See pages 7-8 for printer locations and pricing.
- Posters can also be printed on standard printer paper (8.5 inches by 11 inches). Print the sections of your poster on standard paper, then attached each section directly to the poster board. Arrange the sections into columns and rows on your poster.

### Research Week Poster Awards and Funding Opportunities

- **UCLA Library Research Poster Grant:** students from all majors can apply for a poster grant within the Research Poster Day application. Poster grants support the cost of research poster printing at the UCLA Library!
    - Apply via the Research Poser day application on **MyUCLA -> Campus Life -> Survey** by **April 15.** Grant recipients will be notified by April 30.
- **Dean's Prize:** students who are presenting posters for the humanities, arts, and social science projects can apply to be judged for a Dean's Prize. Applications are due on April 18. Find out more: http://hass.ugresearch.ucla.edu/urw/awardsfunding/

## Elements of the Poster

Posters often have the following sections, which may vary by discipline:

- ☐ Title
- ☐ Author name (your name, faculty advisor's name)
- ☐ Institution
- ☐ Abstract
- ☐ Background or Introduction
- ☐ Hypothesis or Argument or Research Question
- ☐ Methodology or Approach
- ☐ Figures or Images
- ☐ Results, Discussion, and/or Conclusions
- ☐ Future directions
- ☐ References (if needed)
- ☐ Acknowledgements

- **Title:** At the top of your poster, you should have a title that is brief but descriptive, and it should clearly indicate the nature of the project. In no more than 200 characters (approximately 30 words, including spaces), describe your research in succinct terms, reflecting the contents of your abstract. Use key words, and do not use abbreviations, non-English characters, or symbols. Capitalize the first letter of all words in your title. However, do not capitalize article words such as "a," "the," "and," and "of," unless the article is the first word of the title. The title should be easily readable at a distance of about 4-5 feet away. It should be written in "active tense" if possible.

- **Author(s):** The first name should be the name of the poster presenter; after this, the authors are listed in the order of contribution to the work. Indicate the "presenting" author(s) (meaning you and any other authors who will present the work at Undergraduate Research Week) by writing these names in ALL CAPITALS. If it is appropriate to your discipline to list your faculty mentor as an author, you should list your faculty mentor as the last author. (Be sure to ask your faculty mentor if you are not sure!) Do not include titles or degrees such as Dr., Ph.D., etc.

- **Institution:** Below the list of authors, include your department and the university.

- **Abstract:** Your abstract must be at least 100 but no more than 1550 characters (approximately 225 words). The abstract should include introductory or background information, your argument or research question, the methods employed, and your results or conclusions. End the abstract by stating the significance of your research. Do not use symbols, non-English characters, italicized or boldfaced words, references, figures, or tables in your abstract.

- **Background or Introduction:** Present any background information necessary for the reader to understand your poster. Start with a general introduction to the field. Be brief, but include the important points to be sure the reader sees the relevance of your work. Bullet points are best, versus big paragraphs of text.

- **Hypothesis, Argument, or Research Question:** You should clearly state what you hypothesize based on the background information that you provided. You can include a model or diagram here to help explain the question you are interested in. State briefly your approach to answering your hypothesis. DO NOT go into details about methods in this section.

- **Methodology or Approach**: State briefly your methodology for answering your hypothesis or research question(s) (e.g. experimental methods) or your approach to crafting your argument or thesis (e.g. theoretical, disciplinary, etc. approach). You do not need to go into great detail here; it is often better to include details in figures or graphics.

- **Figures or Images:** Here you present the data or components of your project in visual form. Figures may be graphs, lists, tables, photographs, illustrations, diagrams, or other relevant graphics. Typically, each of your figures or graphics will have a title. If it is appropriate, you should also include a legend for each figure or graphic.

- **Results, Discussion, and/or Conclusions:** Here you state the results and conclusions of your project. Be brief and to the point. You should also indicate the significance of your project: what knowledge has your project added to your field? If it is appropriate, mention any alternative explanations for your results and possible explanations for unexpected results.

- **Future Directions:** If it is appropriate, you should explain what you plan to do next on the project. Do your conclusions lead you to a new question? Are you considering trying a new method to answer your original question?

- **References:** List all sources that you cite in the various sections of your poster. You should list your sources using the citation format appropriate to your discipline and project (MLA, APA, Chicago, etc.).

- **Acknowledgements:** If you are funded by a URC program, acknowledge your respective program (i.e. URFP, URSP, MMUF, etc.) as well as the grant you received. Otherwise, it's highly recommended you acknowledge those who assisted you on or contributed to your research, which includes the funding source that paid you or provided the funds used to support your project.

## Designing Your Poster

- **Font size**
  - Title – 72 point or larger
  - Author (you) – 48 point or larger
  - Headings – 48 point or larger
  - Content – 36 point or larger
  - Figure or Image captions – 20 point or bigger

- **Font choice**
  - Choose a clear font to read:
    - Arial
    - Calibri
    - Times New Roman
  - Do not use unclear fonts – examples include:
    - Comic Sans
    - Broadway
    - Harlow
  - Do not *italicize* text

- **Visual information** – Visuals can be figures or images. You can check the relevancy of your visual information by listing the visuals that you would use if you were describing your project with only figures or images – do they contribute to your presentation, or do they distract from it?
  - Figures – These should be clearly labeled according to the format used in your field or discipline (ex. APA, MLA, etc.)
  - Images – Make sure that images are high resolution – they should be at least 300 dpi (dots per inch) to avoid blurriness, and inserted (not pasted) to retain image integrity.

- **Color**
  - Text and background should contrast
    - Background color should make the content stand out
    - Font color should stand out but not be distracting
  - We strongly recommend that you have a white poster background with black or dark text and colorful, eye-catching figures. Having a white background saves ink, and posters with complicated background patterns are difficult for the reader to view.

- **Layout**
  - Posters are typically read top to bottom, left to right
  - Sections should be organized by columns
  - There should be three to four columns on the poster
  - Columns should be aligned
  - Text should be aligned

## Creating a Poster Using PowerPoint

You can create a poster just like a normal PowerPoint slide—only bigger.

- **Set the size of ONE PowerPoint slide to the size of your poster**
  Under the File menu, go to Page Setup. For the size of the slide, type in the actual size of your poster. Your poster can be sized up to 42 inches wide by 42 inches high. Be sure to check with your poster printing location to determine the maximum poster dimensions that the location can print.

  You should always set the page size **before** you begin laying out your poster. Otherwise, you will likely have to go back and revise your poster layout.

- **Insert text**
  Add text to your poster by inserting Text Boxes (under the Insert menu) into your slide. Insert multiple Text Boxes for all of your different text components (title, abstract, etc.). Recommended font sizes are at least 72 point for your title, 48 point for your headings, 36 point for your text, and 20 point for figure labels.

- **Insert images and objects**
  The best way to add an image or object is to insert it via the Insert menu. Make sure your images are high resolution; otherwise, they will appear pixelated once they are enlarged and printed.

- **Adjust spacing, alignment, and size of pictures and text**
  Once you have inserted all of the poster elements, adjust the spacing, alignment, and size of pictures and text to create your desired layout. Make sure your poster is easy to follow.

- **PowerPoint Tip**
  Zoom in to work on detail and zoom out to work on arrangement of parts. Some functions of PowerPoint may not work when you zoom out to fit the whole poster on screen. Select an area to work on and zoom back in to 75-100% to make adjustments.

Resources

- Undergraduate Research Center – Humanities, Arts, and Social Sciences Poster Guidelines and Template: http://hass.ugresearch.ucla.edu/urw/guidelines/#tab-id-3
- UCLA Logo and brand identity information from the UCLA Library:
  http://guides.library.ucla.edu/c.php?g=223540&p=1480860
  (Note: If you use the UCLA logo, it needs to be the official logo!)
- Ten simple rules for a good poster presentation:
  https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1876493/
- A web resource for poster assembly presentation:
  http://www.swarthmore.edu/NatSci/cpurrin1/posteradvice.htm

## UCLA & Westwood Poster Printing Locations and Rates

If you would like to have your poster printed, contact one of the following printing locations. **Please note that due to the high volume of posters being printed, you should allow for ample turnaround time!**

Please also note that some locations may be fully booked by the time you contact them. Contact the printing location ahead of time to ask about printing availability and to schedule the time when you will drop off your poster file for printing. Be sure to ask your faculty mentor about preferred printing locations and any poster printing funds that are available.

Prices may change at the discretion of the printer – remember to confirm pricing prior to printing!

**ASUCLA Bruin Custom Print Shop**
Ackerman Union on the A-Level (opposite Bruin Buzz)
(310) 825-3825
$6 per square foot (matte)
$2.50 per square foot (poster paper)
$7.50 per square foot (glossy)
42 in. x 42 in: $30.63 (standard poster paper), $73.50 (matte), $91.88 (glossy)

**UCLA Design and Media Arts**
Broad Art Center, fourth floor
issag@arts.ucla.edu
https://support.dma.ucla.edu/print/
42 in. x 42 in.: $81.12 (matte)
42 in. x 42 in.: $83.02 (luster)
printing set-up fee may apply

**UCLA Life Science Illustration Office**
Hershey Hall, Room 210
illustration@lifesci.ucla.edu
$13 per linear ft
42 in. x 42 in.: $68 (glossy)

**UCLA School of Engineering**
Boelter Hall, Room 2685
https://www.matserv.ucla.edu/poster-printing/
$7.50 per square foot (glossy)
42 in. x 42 in.: $91.88 (glossy)
Mailing tubes in 36”. 42” and 48” lengths ( 3” diameter) at $3.50/ea

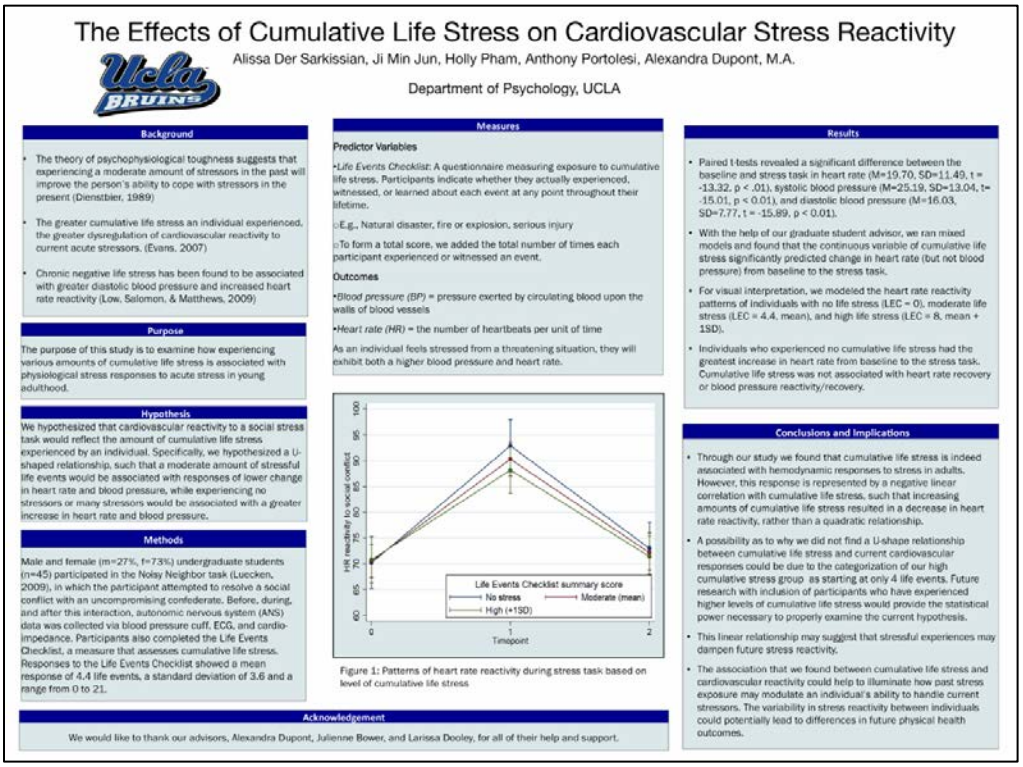
**UCLA Mail, Document & Distribution Services**
555 Westwood Plaza, Level B, Los Angeles, CA 90095
(310) 825-0433
mdds@mdds.ucla.edu
https://www.mdds.ucla.edu/document-services
42 in. x 42 in.: $111.02 (matte or satin)

**UCLA Psychology Technical Services**
Franz Hall A544
Open Monday-Thursday
(310) 825-3430
techservices@psych.ucla.edu
http://www.psych.ucla.edu/departmental-units/facilities/technical-services/graphics-and-media
Contact via email with initial printing inquiry in advance to see if they have the bandwidth to print your poster. This printer reaches capacity quickly and may not be able to print your poster.
$11.04 per linear square foot (semi-gloss)
42 in. x 42 in.: $38.65 (semi-gloss)

**Copymat Westwood**
10919 Weyburn Avenue, Los Angeles, CA 90024
Open Monday – Friday 9AM – 5PM
www.copymatwestwood.com
printit@copymatwestwood.com
(310) 824 5276
$7.50 per sq foot (satin, semi-gloss, or matte)
42” x 42”: $90 (satin, semi-gloss, or matte)
Arrangements can be made outside of normal business hours for pickup
Same day turnaround is available if needed at no extra cost

**FedEx Office (formerly Kinko’s) in Westwood**
10924 Weyburn Ave, Los Angeles, CA 90024
http://local.fedex.com/ca/los-angeles/office-0897/
(310) 475-0789
$7.50 per square foot (matte)
$7.96 per square foot (heavy coat)
$12.50 per square foot (photo glossy)
42 in. x 42 in.: $91 (matte), $97.50 (heavy coat), $153 (photo glossy)
UCLA students will receive an additional 10% discount

# Research Poster Examples



## The Effects of Cumulative Life Stress on Cardiovascular Stress Reactivity

Alissa Der Sarkissian, Ji Min Jun, Holly Pham, Anthony Portolesi, Alexandra Dupont, M.A.

Department of Psychology, UCLA

**Background**

- The theory of psychophysiological toughness suggests that experiencing a moderate amount of stressors in the past will improve the person's ability to cope with stressors in the present (Dienstbier, 1989)
- The greater cumulative life stress an individual experienced, the greater dysregulation of cardiovascular reactivity to current acute stressors. (Evans, 2007)
- Chronic negative life stress has been found to be associated with greater diastolic blood pressure and increased heart rate reactivity (Low, Salomon, & Matthews, 2009)

**Purpose**

The purpose of this study is to examine how experiencing various amounts of cumulative life stress is associated with physiological stress responses to acute stress in young adulthood.

**Hypothesis**

We hypothesized that cardiovascular reactivity to a social stress task would reflect the amount of cumulative life stress experienced by an individual. Specifically, we hypothesized a U-shaped relationship, such that a moderate amount of stressful life events would be associated with responses of lower change in heart rate and blood pressure, while experiencing no stressors or many stressors would be associated with a greater increase in heart rate and blood pressure.

**Methods**

Male and female (m=27%, f=73%) undergraduate students (n=45) participated in the Noisy Neighbor task (Luecken, 2009), in which the participant attempted to resolve a social conflict with an uncompromising confederate. Before, during, and after this interaction, autonomic nervous system (ANS) data was collected via blood pressure cuff, ECG, and cardio-impedance. Participants also completed the Life Events Checklist, a measure that assesses cumulative life stress. Responses to the Life Events Checklist showed a mean response of 4.4 life events, a standard deviation of 3.6 and a range from 0 to 21.

**Measures**

Predictor Variables

- *Life Events Checklist*: A questionnaire measuring exposure to cumulative life stress. Participants indicate whether they actually experienced, witnessed, or learned about each event at any point throughout their lifetime.
  - E.g., Natural disaster, fire or explosion, serious injury
  - To form a total score, we added the total number of times each participant experienced or witnessed an event.

Outcomes

- *Blood pressure (BP)* = pressure exerted by circulating blood upon the walls of blood vessels
- *Heart rate (HR)* = the number of heartbeats per unit of time

As an individual feels stressed from a threatening situation, they will exhibit both a higher blood pressure and heart rate.




Figure 1: Patterns of heart rate reactivity during stress task based on level of cumulative life stress

**Results**

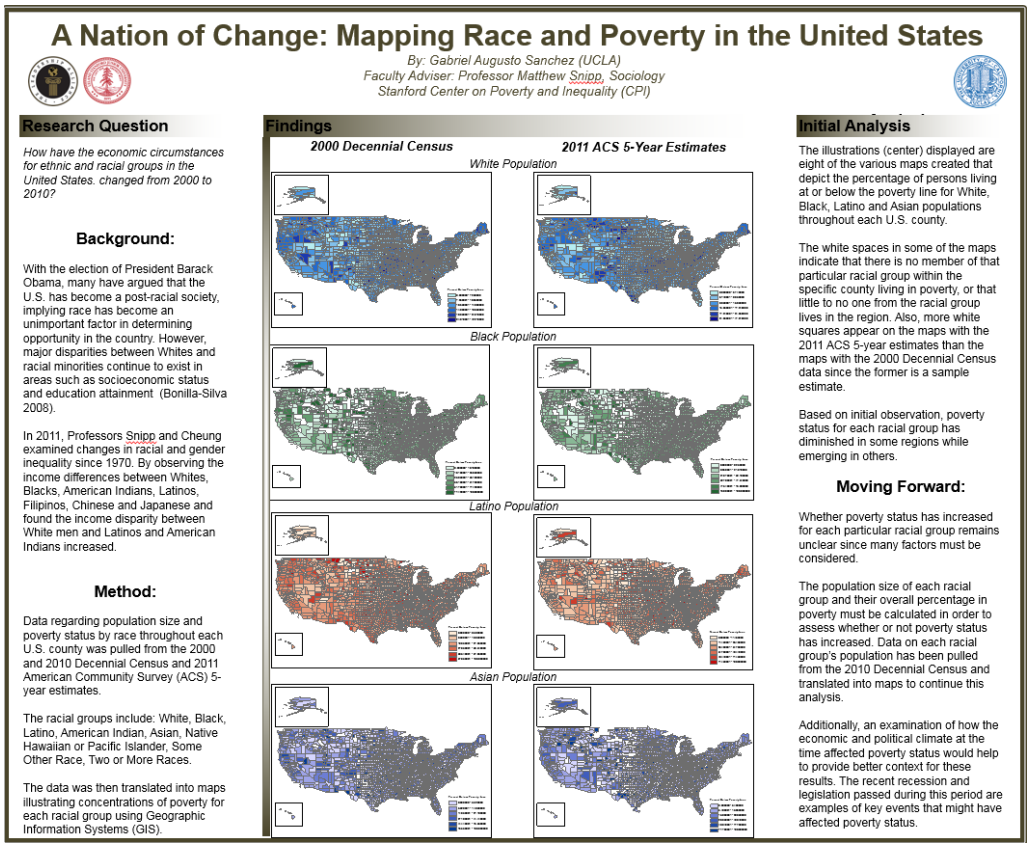
- Paired t-tests revealed a significant difference between the baseline and stress task in heart rate ($M=19.70$, $SD=11.49$, $t = -13.32$, $p < .01$), systolic blood pressure ($M=25.19$, $SD=13.04$, $t= -15.01$, $p < 0.01$), and diastolic blood pressure ($M=16.03$, $SD=7.77$, $t = -15.89$, $p < 0.01$).
- With the help of our graduate student advisor, we ran mixed models and found that the continuous variable of cumulative life stress significantly predicted change in heart rate (but not blood pressure) from baseline to the stress task.
- For visual interpretation, we modeled the heart rate reactivity patterns of individuals with no life stress (LEC = 0), moderate life stress (LEC = 4.4, mean), and high life stress (LEC = 8, mean + 1SD).
- Individuals who experienced no cumulative life stress had the greatest increase in heart rate from baseline to the stress task. Cumulative life stress was not associated with heart rate recovery or blood pressure reactivity/recovery.

**Conclusions and Implications**

- Through our study we found that cumulative life stress is indeed associated with hemodynamic responses to stress in adults. However, this response is represented by a negative linear correlation with cumulative life stress, such that increasing amounts of cumulative life stress resulted in a decrease in heart rate reactivity, rather than a quadratic relationship.
- A possibility as to why we did not find a U-shape relationship between cumulative life stress and current cardiovascular responses could be due to the categorization of our high cumulative stress group as starting at only 4 life events. Future research with inclusion of participants who have experienced higher levels of cumulative life stress would provide the statistical power necessary to properly examine the current hypothesis.
- This linear relationship may suggest that stressful experiences may dampen future stress reactivity.
- The association that we found between cumulative life stress and cardiovascular reactivity could help to illuminate how past stress exposure may modulate an individual's ability to handle current stressors. The variability in stress reactivity between individuals could potentially lead to differences in future physical health outcomes.

**Acknowledgement**

We would like to thank our advisors, Alexandra Dupont, Julienne Bower, and Larissa Dooley, for all of their help and support.



## A Nation of Change: Mapping Race and Poverty in the United States

*By: Gabriel Augusto Sanchez (UCLA)*
*Faculty Adviser: Professor Matthew Snipp, Sociology*
*Stanford Center on Poverty and Inequality (CPI)*

**Research Question**

*How have the economic circumstances for ethnic and racial groups in the United States. changed from 2000 to 2010?*

**Background:**

With the election of President Barack Obama, many have argued that the U.S. has become a post-racial society, implying race has become an unimportant factor in determining opportunity in the country. However, major disparities between Whites and racial minorities continue to exist in areas such as socioeconomic status and education attainment (Bonilla-Silva 2008).

In 2011, Professors Snipp and Cheung examined changes in racial and gender inequality since 1970. By observing the income differences between Whites, Blacks, American Indians, Latinos, Filipinos, Chinese and Japanese and found the income disparity between White men and Latinos and American Indians increased.

**Method:**

Data regarding population size and poverty status by race throughout each U.S. county was pulled from the 2000 and 2010 Decennial Census and 2011 American Community Survey (ACS) 5-year estimates.

The racial groups include: White, Black, Latino, American Indian, Asian, Native Hawaiian or Pacific Islander, Some Other Race, Two or More Races.

The data was then translated into maps illustrating concentrations of poverty for each racial group using Geographic Information Systems (GIS).

**Findings**

*2000 Decennial Census* — *2011 ACS 5-Year Estimates*

*White Population*

*Black Population*

*Latino Population*

*Asian Population*

**Initial Analysis**

The illustrations (center) displayed are eight of the various maps created that depict the percentage of persons living at or below the poverty line for White, Black, Latino and Asian populations throughout each U.S. county.

The white spaces in some of the maps indicate that there is no member of that particular racial group within the specific county living in poverty, or that little to no one from the racial group lives in the region. Also, more white squares appear on the maps with the 2011 ACS 5-year estimates than the maps with the 2000 Decennial Census data since the former is a sample estimate.

Based on initial observation, poverty status for each racial group has diminished in some regions while emerging in others.

**Moving Forward:**

Whether poverty status has increased for each particular racial group remains unclear since many factors must be considered.

The population size of each racial group and their overall percentage in poverty must be calculated in order to assess whether or not poverty status has increased. Data on each racial group's population has been pulled from the 2010 Decennial Census and translated into maps to continue this analysis.

Additionally, an examination of how the economic and political climate at the time affected poverty status would help to provide better context for these results. The recent recession and legislation passed during this period are examples of key events that might have affected poverty status.

# Implicit Stereotypes Among Latino Children

Kevin L. Ruiz, Cari Gillen-O'Neel, Andrew J. Fuligni
Department of Psychology, University of California, Los Angeles

## Background

Previous studies have shown that Latinos show an in-group preference when compared to other ethnic minorities. It is not clear, however, whether their in-group feelings are positive or negative. Other studies have shown that Latinos view themselves as less intelligent when compared with their white counterparts. In the few developmental studies that have been done, implicit attitudes/stereotypes remained consistent from childhood to adulthood. However, these studies have been limited in that they have predominantly examined ethnic stereotypes among only Whites.

The goal of the current study is to examine the development of Latino children's implicit stereotypes about their ethnicity, in general, and academically.

## Research Questions

- What are Latino children's implicit in-group attitudes in general?
- What are Latino children's implicit in-group stereotypes in academics?
- How do these attitudes/stereotypes differ at different ages?

## Participants

- 126 Latino children
- 55.6% Female
- $M_{age}$ = 9.39
- Grade Distribution:
  - 2nd: 48
  - 4th: 38
  - 5th: 40
- Participants were recruited from two schools in the Los Angeles area. One of the schools was homogeneously Latino, and the other was ethnically diverse.

## Procedure

Following previous researchers, we assessed implicit stereotypes with a reaction time measure. Latino children separated positive and negative words (e.g., *nice*, *mean*, *neat*, *sloppy*, *friend*, *enemy*) after being primed with photographs of children of their same ethnicity.

## Procedure

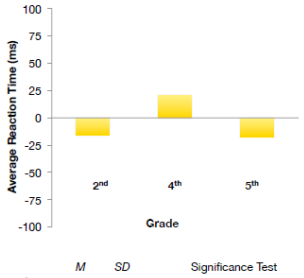
Example:

positive/negative word + = Reaction Time

positive/negative word + = Reaction Time

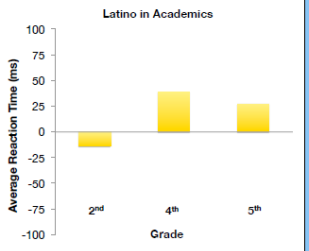
Stereotypes were inferred from differences in speed between children's reactions to the positive words as compared with the negative words.

## Results




| | *M* | *SD* | Significance Test |
|---|---|---|---|
| 2nd | -16.06 | 157.59 | $t(47) = -.71$, $p = .48$ |
| 4th | 22.94 | 123.39 | $t(37) = 1.05$, $p = .30$ |
| 5th | -17.25 | 146.06 | $t(39) = -.75$, $p = .46$ |

## Results




| | *M* | *SD* | Significance Test |
|---|---|---|---|
| 2nd | -13.90 | 159.22 | $t(47) = -.61$, $p = .55$ |
| 4th | 38.68 | 158.95 | $t(37) = 1.50$, $p = .14$ |
| 5th | 26.87 | 114.39 | $t(39) = 1.486$, $p = .15$ |

## Discussion

- For their ethnic group, Latino children demonstrated neither positive nor negative implicit stereotypes in general and in academics
- Although the average implicit attitudes and stereotypes were close to zero, there was a wide range across participants
- The task is reliant on fast reaction times, and therefore may not have been a valid measure for young children
- Further research should consider using a different paradigm to look at the development of Latino children's implicit in-group stereotype

## Contact Information

For further information: Contact Kevin L. Ruiz: kevinruiz@ucla.edu

# THE ASSOCIATION OF JOINT ENGAGEMENT AND SOCIAL INTERACTION

XUAN-THANH NGUYEN, KATHY GUEVARA, & TED HUTMAN, PH.D
UCLA CENTER FOR AUTISM RESEARCH AND TREATMENT, UNIVERSITY OF CALIFORNIA, LOS ANGELES

## INTRODUCTION

**BACKGROUND:**

- Joint attention and social interaction are social skills that measure the children's shared interests in their environment. Research have shown that children with autism engaged in fewer joint attention with another person and have lower interest for other people (Sandy et al., 1990; Sandy et al., 1986)
- Children with autism who had more synchronized behaviors with their caregivers had "developed superior joint attention and language" than did the children with less synchronization (Siller & Sigman, 2002)
- Few studies have examined social interaction and its relation to diagnostic outcomes. Furthermore, the association between social interaction and joint engagement has not been evaluated.

**OBJECTIVES:**

- Determine whether there is a relationship between joint engagement and social interaction and whether risk status for autism regulates that relationship

**HYPOTHESES:**

- A positive correlation between joint engagement and social interaction, regardless of diagnosis
- Children with autism will demonstrate less joint engagement and fewer social interaction compared to typically developing children.

## METHOD

**PARTICIPANTS:**

- 48 children (29 males & 19 females) were recruited as participants
  - 24 children with autism (ASD)
  - 24 typically developing children (TD)
- Participants were followed longitudinally until 36 months of age.

**BEHAVIORAL MEASURES:**

1. Joint Engagement: 4 minute free-play interaction between parent and child with various toys (administered at 18 months only)
   - Engagement
     - Joint Engagement: child and parent attending to the same activity with shared focus of attention
     - Parallel: both child and parent are attending, but are not attending to the same object
     - No Object: neither child or parent are attending to anything
     - Can't Tell: bad camera angle, child is misbehaving/too fussy
   - Communication
     - Maternal Initiations: parents directs child's attention to another object
     - Child Initiations: child directs parent's attention
     - Child Responses: child responses to parent's attention
2. Social Interaction: dyadic interaction between child and examiner during an assessment of nonverbal communication behaviors (administered at 12 months and 18 months)
   - Turn taking: examiner presents child with a ball, then behaviors are measured during this turn-taking game
     - Initiates turn taking: the 1st time the child rolls ball back to examiner before examiner
     - Treat: child throws ball somewhere else with eye contact
     - Response to turn taking: child throw/roll ball back to the examiner (not the 1st time)
   - Tickles: behaviors that occur during parent-between tickle trials
     - Act: child acts after tickle indicating want for more tickles
     - Eye contact: child makes eye contact with examiner after tickle
     - Appeal: Child combines act with eye contact after tickle

## RESULTS

**GROUP DIFFERENCES**

- Diagnostic groups differed significantly on social interaction variables measured at 12 months
  1. Response to turn-taking
  2. Acts during tickles
  3. Appeals during tickles
- 18-month social interaction variables were not significantly related to diagnostic outcome

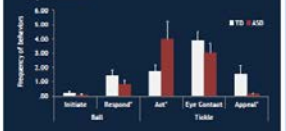
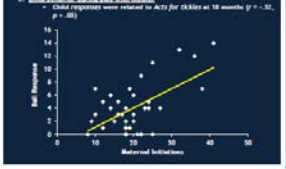



Figure 1. Social Interaction Measures by Diagnostic Group at 12 months
* Indicates significant group differences ($p < .05$)

**ASSOCIATIONS WITH PARENT-CHILD PLAY INTERACTIONS AT 18 MONTHS**

1. Dyadic Engagement
   - Time child was jointly engaged with mother during play at 18 months was not related to social interaction variables at 12 months
   - Mother-child engagement and turn-taking measures were more negative for children with autism ($M = 14.9$) than for typically developing children ($M = 4$)
   - Mother-child joint engagement was related to *Acts for tickles* at 18 months ($r^2 = .48$, $p = .002$)
2. Maternal behaviors during play with child
   - Maternal Initiations were related to the following 18-month social interaction variables:
     1. Initiates turn taking ($r = .56$, $p < .001$)
     2. Response to turn taking ($r = .37$, $p < .001$)
     3. Appeals during tickles ($r = .32$, $p = .049$)
3. Child behavior during play with mother
   - Child responses were related to *Acts for tickles* at 18 months ($r = .32$, $p < .05$)




## DISCUSSION

**CONCLUSION:**

- Social interaction behaviors differed between diagnostic groups at 12 months, not at 18 months
- Social interaction were better predictors of children's diagnostic outcome compared to risk status
- Negative correlation between joint engagement and social interaction
  1. The social environment that the child is in can predict whether the child will elicit the appropriate behavior. If the situation is unpredictable, children with autism will not carry out the expected behavior (Weiss & Harris, 2001). Having free play with the parent is a more predictable situation than having presented a ball during an assessment from a stranger. Children with autism might react slower in the latter situation because they are not sensitive to those social cues.
  2. Joint engagement is a triadic interaction, requiring the child and parent to engage in one activity. Children who are better at triadic engagement will demonstrate less turn-taking because they are more proficient at deploying triadic attention.
  3. Social interaction is a dyadic interaction, requiring less of the child's attention. Thus children who perform dyadic turn-taking will be less interested in sharing their attention with someone else.
  4. Since triadic engagement is related to language development, it is not surprising that children who are later diagnosed with autism will demonstrate more dyadic turn-taking and less triadic engagement.

**IMPLICATIONS:**

- Since children with autism were similar to their typically developing peers at 18 months, this suggests that having children diagnose for autism at an earlier age is critical. Further research is needed to understand why 12-months is a vulnerable age during children's development.
- Joint engagement and social interaction measures influence later social responsiveness to different ways (Dissanayake & Clifford, 2009)
- Caregivers should promote social, triadic engagement when playing with their child in order to develop and improve their child's language acquisition

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