



<http://www.csuci.edu/ira/index.htm>

Application
Instructionally Related Activities Funds Request
2012-2013 Academic Year
DEADLINE: Fall and Academic Year 3/31/12
Spring 2013 deadline is 10/31/12

Applications must first be sent to the appropriate program chair. Chairs will then recommend and route them to the Dean's Office for review and authorization. The Dean's Office will then forward them to the IRA Committee for consideration.

Activity Title: 2013 National Conference on Undergraduate Research (NCUR)

Project Sponsor/Staff (Name/Phone): **Kimmy Kee-Rose, Ph.D./805-437-3276**

Activity/Event Date(s): **April 10 – April 13, 2013**

Date Funding Needed By: **January 8, 2013**

***Please Note that for Fall Requests the earliest that you will be notified of funding availability will be early June 2012 and for Spring Requests early January 2013.*

Please check if any of the following apply to your IRA:

- | | |
|--|---|
| <input type="checkbox"/> Equipment Purchase | <input checked="" type="checkbox"/> Field Trip |
| <input type="checkbox"/> Event | <input type="checkbox"/> Participant data collection for public dissemination, i.e. interviews/surveys that result is a journal/poster session/newsletter |
| <input type="checkbox"/> IT Requirements | <input type="checkbox"/> Risk Management Consultation |
| <input type="checkbox"/> International Travel | <input type="checkbox"/> Late Submission |
| <input type="checkbox"/> Space/OPC Requirements | |
| <input type="checkbox"/> Infrastructure/Remodel | |
| <input checked="" type="checkbox"/> Other <u>Attend National Conference on Undergraduate Research (NCUR) to present results of empirical studies</u> | |

Previously Funded: YES NO Yes, Request # **0446**

*If previously funded, please attach copy of IRA Report

Does your proposal require IRB (Institutional Review Board) approval: Yes No

Assessment submitted for previously Funded Activity: YES NO

Academic Program or Center Name and Budget Code: **Psychology, Budget Code 735**

Date of Submission: **October 30, 2012**

Amount Requested: **\$13,553.00**
 (Should match item 2. E. on page 4)

Estimated Number of Students Participating: **14 CI Junior and Senior Undergraduate**

Students

Application
Instructionally Related Activities Funds Request
2012-2013 Academic Year

Conditions and Considerations

Equipment Purchase-If requesting large equipment, Project Sponsor must show proof of correspondence with OPC Administration. In addition, all other purchases must follow Procurement Guidelines.

Events-For a large event, consultation with the events coordinator is recommended.

Participant Data Collection for Public Dissemination-If Project Sponsor proposes to conduct research with human participants then it may be subject to IRB (Institutional Review Board for the Protection of Human Subjects) review. It is the Project Sponsor's responsibility to inquire with the IRB **prior** to IRA application submission to determine if the project is exempt from IRB review so that funding is not delayed. Please indicate on the cover page if your project is exempt from IRB review.

Field Trip-If approved, Identified Risks of Participation and Release Agreement must be submitted for each student to the Program Office (Public Folders-HR Forms).

IT Requirements-Requires proof of correspondence and approval from IT Administration

International Travel-Requires International Travel application be submitted to Center for International Affairs.

Risk Management Consultation-Requires proof of correspondence with Risk Management.

Space/OPC Requirements, Infrastructure/Remodel-Requires proof of correspondence with OPC Administration .

Late Submission - Requires explanation for emergency funding.

Fiscal Management: Project Sponsor's program will be responsible for all costs incurred over and above what is funded through the IRA award and will be responsible for seeing that any revenue that is intended to offset the amount of the IRA award is transferred accordingly.

Application
Instructionally Related Activities Funds Request
2012-2013 Academic Year

Requirements and Signatures

Please provide the following in your application:

1. **Brief Activity Description.** Describe the activity and its relationship to the educational objectives of the students' program or major.

Funding is requested for 14 CI undergraduate students from the Psychology Anthropology, Biology, and Spanish programs, who are currently enrolled in my ongoing year-long Psychology courses (see #2), to present the findings of their empirical research at the 27th Annual National Conference on Undergraduate Research (NCUR) which will be hosted by University of Wisconsin-La Crosse, Wisconsin from April 10 to April 13, 2013. The NCUR is dedicated to promoting undergraduate research, scholarship, and creative activity in all fields of study. This annual gathering welcomes scholars and their faculty mentors from across the nation. The NCUR creates a unique environment for the celebration and promotion of undergraduate student achievement.

Last year, through the generous funding of IRA, I was able to bring 15 junior and senior undergraduate students to this conference. These students presented a total of two papers and four posters on the findings of their research projects at CSUCI, and they received excellent feedback. More importantly, the students reported that the experience was tremendously helpful to them for increasing their enthusiasm and commitment for pursuing their career goals in psychology as well as enhancing their applications for graduate school (For more details, please see students' assessments submitted to IRA).

In addition, two manuscripts were submitted for publication in the Conference Proceedings. Both manuscripts were peer reviewed by the Proceeding Boards, and were accepted for publication (Please see attached manuscripts. ***IRA funding was acknowledged in the manuscripts***). This opportunity further allows our students to list their publications on their resume for graduate school applications.

For the upcoming conference in 2013, the 14 new undergraduate students from my courses have submitted a total of five abstracts for paper presentations. Therefore, we are now making this request for funding.

One of the primary goals of the courses listed in #2 is for students to present and disseminate their research findings at regional and national scientific conferences. In the field of Psychology, the experience of presenting at such conferences would help to better prepare students and significantly enhance

their ability to obtain competitive positions in graduate study programs across the fields of behavioral science. Hence, this opportunity is one that will not only deal with meeting the Psychology program learning outcomes as listed below, but will enhance their future careers as well:

- Students should understand and be able to use major research methods in psychology (design, data analysis & interpretation).
- Students should have an understanding of applications of psychology to personal, social and organizational issues.
- Students should use and respect skeptical inquiry, critical thinking, and the scientific approach to understanding behavior.
- Students should have an understanding of the complexity of cultural diversity.
- Students should be able to express themselves effectively in written and oral communication.

Finally, supporting students' original research and the dissemination of that research helps to meet the CSUCI institutionally-based learning outcomes.

2. **Relation to IRA to Course Offerings.** All IRAs must be integrally related to the formal instructional offerings of the University and must be associated with scheduled credit courses. Please list all classes that relate to the program proposed.

PSY 300 (Psychological Research and Statistical Methods and Lab I)
PSY 301 (Psychological Research and Statistical Methods and Lab II)
PSY 490 (Special Topics: Experimental Psychopathology I and II)
- A one-year research training experience course
PSY 494 (Independent Research in Psychology)
PSY 497 (Directed Study in Psychology)

3. **Activity Assessment.** Describe the assessment process and measures that the program will use to determine if it has attained its educational goals. **Please note a report will be due at the end of the semester.**

For the courses listed in #2, students' final grade will be based upon their participation and performance on the various aspects of research activities including abstract submissions and conference presentations.

In addition, students will prepare and present their work at the Sage Faculty Student Research Forum and Annual Psychology Poster Presentations in May 2013. Their papers/posters will be evaluated using a rubric designed to assess the degree to which Psychology program objectives have been met.

4. **Activity Budget.** Please enclose a complete detailed budget of the entire Activity **bold** specific items of requested IRA funding. (Page 4)

Estimated Cost of Trip for 14 Students:
 Roundtrip Airfare (14 students X \$594.00/person) \$ 8,316.00
 Roundtrip Shuttle Transportation between Airport and La Crosse \$ 60.00
 Conference Registration (14 students X \$185.00/person) \$ 2,590.00
 * Hotel in La Crosse, Wisconsin (5 rooms @\$517.56/room for 3 nights) \$ 2,587.80
 TOTAL AMOUNT REQUESTED: \$13,553.00

* We are only requesting sufficient funding to cover the costs for 5 hotel rooms, as 2 to 3 students will be sharing a room.

In addition, students will pay for their own meals, which is estimated to be \$1,400.00 (14 students x \$25.00/day/person x 4 days), shuttle transportation between LAX and CI (\$528 for a 14-passenger van roundtrip), and other unexpected costs that arise during travel.

5. **Sources of Activity Support.** Please list the other sources of funding, and additional support for the activity.

The current request has no other sources of funding. Each student will be paying for his or her own meals, shuttle transportation to and from LAX, and incidentals during the trip. These costs are not included in the requested budget.

7. **Acknowledgment.** Project Sponsor and Program Chair acknowledge that they have reviewed and accepted the Conditions and Considerations detailed on page 2.

Signatures and Dates

Kimmy Kee-Rose, Ph.D. 10/30/2012
Date

Virgil H. Adams III 10/30/2012
Date

KAREN Carey 10/31/12
Date

Application
Instructionally Related Activities Funds Request
2012-2013 Academic Year

ACTIVITY BUDGET FOR 2012-2013

1. Operating Expense Budget

A. Supplies	_____
B. Vendor Printing	_____
C. In-State Travel	_____
D. Out-of-State Travel	<u>\$8,316.00 + \$60.00 = \$8,376.00</u>
E. Equipment Rental	_____
F. Equipment Purchase	_____
G. Contracts/Independent Contractors	_____
H. Honorarium	_____
I. OPC Chargeback	_____
J. Copier Chargeback	_____
K. Other (Conference Registration)	<u>\$2,590.00</u>
(Hotel Accommodations)	<u>\$2,587.80</u>
TOTAL Expenses	<u>\$13,553.00</u>

2. Revenue

A. Course Fees	_____
B. Ticket Sales	_____
C. Out of Pocket Student Fees (exclusive of course fees)	_____
D. Additional Sources of funding (Please specify And indicate source)	_____

Total Revenue **\$13,553.00**

E. Total Requested from IRA **\$13,553.00**

**Instructional Related Activities
Report Form – Proposal 0446**

SPONSOR	DEPARTMENT
Kimmy Kee-Rose, Ph.D	Psychology

ACTIVITY TITLE	DATE (S) OF ACTIVITY
2012 National Conference on Undergraduate Research (NCUR)	March 28 – March 31, 2012

PLEASE EXPLAIN (1) DESCRIPTION OF ACTIVITY; (2) HOW DID THE ACTIVITY RELATE TO A COURSE(S); AND (3) WHAT YOU LEARNED FROM THE PROCESS.

1. DESCRIPTION OF ACTIVITY. Funding was requested for 15 CI undergraduate students from the Psychology and Business programs, who were enrolled in my ongoing year-long Psychology courses (see #2), to present the findings of their empirical research at the 26th Annual National Conference on Undergraduate Research (NCUR) which was hosted by Weber State University in Ogden, Utah from March 29 to March 31, 2012. The NCUR is dedicated to promoting undergraduate research, scholarship, and creative activity in all fields of study. This annual gathering welcomes scholars and their faculty mentors from across the nation. The NCUR creates a unique environment for the celebration and promotion of undergraduate student achievement.

Through the generous funding of IRA (\$9999), the students presented a total of two papers and four posters on the findings of their research projects at CI, and they received excellent feedback. More importantly, the students reported that the experience was tremendously helpful to them for increasing their enthusiasm and commitment for pursuing their career goals in psychology as well as enhancing their applications for graduate school.

In addition, two manuscripts were submitted for publication in the Conference Proceedings (**IRA funding was acknowledged in the manuscripts**). Both manuscripts were peer reviewed by the Proceeding Boards, and recently, have been accepted for publication. This opportunity further allows our students to list their publications on their resume for graduate school applications.

2. HOW DID THE ACTIVITY RELATE TO A COURSE(S)?

One of the primary goals of the courses listed below was for students to present and disseminate their research findings at regional and national scientific conferences. In the field of Psychology, the experience of presenting at such conferences would help to better prepare students and significantly enhance their ability to obtain competitive

positions in graduate study programs across the fields of behavioral science. Hence, this opportunity was one that would not only deal with meeting the Psychology program learning outcomes, but would enhance their future careers as well

PSY 300 (Psychological Research and Statistical Methods and Lab I)
PSY 301 (Psychological Research and Statistical Methods and Lab II)
PSY 490 (Special Topics: Experimental Psychopathology I and II)
PSY 494 (Independent Research in Psychology)
PSY 497 (Directed Study in Psychology)

3. WHAT DID STUDENTS LEARN FROM THE PROCESS?

Please see attached comments from students.

Downey, Maria Rose
Barber, Gloria
Iljin, Cassandra
Espinoza, Cassey
Taylor, Trisha
Fernandez, Erika
Roth, Alexandra
Butler, Chadley
Rodriguez, Gerardo
Zhang, Robert
Keshavarzian, Neggin
Burns, Andrea
Hernandez, Gina
Hinde, Samantha
Toache, Jasmine

****Please attach assessment forms from students, list of attendees, peoplesoft program report**

E-mail to the Dean's Office 30 days after activity

Proceeding of The National Conference
On Undergraduate Research (NCUR) 2012
Weber State University, Ogden Utah
March 29-31, 2012

To Eat or Not To Eat: Assessing Neurocognitive Processes as Predictors of Maladaptive Eating Behaviors

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Psychology Department
California State University Channel Islands
One University Drive
Camarillo, California 93012 USA

Faculty Advisor: Dr. Kimmy Kee

Abstract

There is general agreement that individuals with anorexia nervosa show higher levels of self-control, constraint, and inhibition, whereas those with bulimia nervosa exhibit a lack of impulse control. Yet the fundamental questions about the nature and scope of these neurocognitive processes in people with pathological eating patterns are not fully known. The current study examined the neurocognitive predictors (attentional impulsiveness, motor impulsiveness, non-planning impulsiveness, self-control and inhibition) of anorexia nervosa and bulimia nervosa traits in a sample of undergraduate students. For the interim analyses, data are currently available on 88 undergraduate students. Participants' neurocognitive processes were assessed using the Barratt-11 Impulsivity Scale, Self-Control Scale, and Stop Signal Inhibition Task. Traits of anorexia nervosa were measured using the Eating Attitudes Test and traits of bulimia nervosa were assessed using the Eating Questionnaire-Revised. A series of multiple regression analyses revealed that among the neurocognitive predictors, attentional impulsiveness ($B = .65$, $t(87) = 2.12$, $p = .037$) and non-planning impulsiveness ($B = -.051$, $t(87) = -2.24$, $p = .028$) were significant determinants of anorexia nervosa traits. Similarly, non-planning impulsiveness ($B = -.49$, $t(87) = -2.24$, $p = .028$) was the strongest determinant of bulimia nervosa traits, whereas attentional impulsiveness ($B = .57$, $t(87) = 1.925$, $p = .058$) and self-control ($B = -.12$, $t(87) = -1.952$, $p = .055$) were at trend levels. Both self-control and inhibition were not significant predictors of traits of anorexia nervosa and bulimia nervosa. These preliminary findings suggest that the neurocognitive function of impulsivity may serve as an important predictor of maladaptive eating behaviors.

Keywords: maladaptive eating behaviors, impulsiveness, self-control

1. Introduction

Prior studies involving pathological eating patterns have demonstrated a significant difference in neurocognitive processes between people with anorexia nervosa and bulimia nervosa. Anorexia nervosa is defined as a disorder in

which people are unwilling or unable to maintain a normal body mass, with weight loss resulting in 85% or less of typical body weight for an individual's height and body frame. These individuals also experience an intense fear of gaining weight with a distorted perception of their image and body shape¹. Bulimia nervosa is characterized by excessive food consumption in a short period of time (binge eating) alternating with extreme behaviors to compensate for the added calories, such as vomiting or inappropriate use of laxatives or diuretics (purging), fasting or excessive exercise (non-purging). These behaviors must occur approximately twice weekly for a period of three months or more².

Higher levels of self-control, constraint, and inhibition were found in people with anorexia nervosa, while a lack of impulse control was seen in those with bulimia nervosa. For instance, in a review of impulsivity and its role in eating behaviors, Lowe and Eldredge⁶ reported a higher prevalence of impulsive behaviors among people who were binge eaters (bulimia nervosa and anorexia nervosa) as compared to those who displayed controlled eating behaviors. It seems likely that impulsivity may be the reason why some dieters become purging bulimics; therefore, if impulsivity appears to be a risk factor in the development of eating disorders, then a family history of impulsive behaviors would increase the probability of these disorders occurring. Lowe and Eldredge⁶ further stated that a family history of impulsivity was more likely to be associated with the development of eating disorders than some other (non-impulsive) form of psychopathology.

A study by Tangney, Baumeister and Boone¹⁰ posited that individuals with higher self-control exhibited fewer impulse regulation problems. For example, they showed better restraint in food intake and alcohol consumption, as compared to individuals possessing lower levels of self-control. These investigators tested the Eating Disorder Index,⁵ a self-rating questionnaire used to evaluate a person's attitudinal and behavioral characteristics of anorexia and bulimia nervosa, in relation to self-control. The EDI subscales are designed to measure: the individual's drive to be thin, bulimia, dissatisfaction with their body, incompetence, interpersonal distrust, interoceptive awareness and fears of maturity. They found that people who were high in self-control reported fewer eating disorder symptoms and fewer cognitive patterns that have been linked to eating disorders, implying that self-control is negatively correlated with most of the EDI scale.

Another study by Rosval et al.⁹ examined the specific aspects of impulsive responses such as inhibition, planning and attention in women with eating disorders, using the Barratt Impulsiveness Scale. Their findings demonstrated that binge eaters scored significantly higher than both the restricted eating and control groups on impulsivity. Specifically, the eating disorder sample showed greater attentional impulsivity compared to the control group, which implied that behavioral forms of impulsivity, and not cognitive forms, were linked to binge eating behaviors.

In a more recent investigation, Birgegård et al.³ examined different components of self-perception including self-image, self-neglect, self-production and self-control as determinants of eating disorders. Their results indicated that individuals with anorexia nervosa showed higher levels of self-control, constraint, and inhibition, all of which contributed to an inclination to view their behaviors as a positive means to get their "ideal" body. Consequently, these individuals would tend to deny having an illness and would be resistant to treatment. On the other hand, a lack of impulse control, self-hate, and negative self-image were the strongest influential factors in people with bulimia nervosa.

This current study was designed to test the neurocognitive determinants of impulsivity, self-control, and inhibition on maladaptive eating patterns (i.e., traits of anorexia nervosa and bulimia nervosa) in undergraduate students. Based on the existing literature, we hypothesized that these aspects of neurocognition would be significant predictors of anorexia nervosa and bulimia nervosa tendencies.

2. Methods and Materials

2.1 participants:

A sample of 88 undergraduate students (71 women, 17 men) from California State University Channel Islands were recruited and participated in this study. The mean age for this sample was 25.10 years ($SD = 6.98$). The racial and ethnic composition of participants was as follows: 51.14% were Caucasian, 32.96% were Hispanics, 5.68% were African-American, and 10.22% were Asian or other. Informed consent was obtained from each participant and the participant was debriefed at the end of testing.

2.2 measures and procedures:

Participants were asked to complete the following battery of tests, which took between 30 to 40 minutes to complete. The Self-Control Scale, Barratt Impulsiveness Scale, and STOP-IT computerized test of inhibition were counterbalanced, using the Latin Square method, to control for possible order effects. Following these measures, subjects completed the Eating Attitudes Test and the Eating Questionnaire-Revised.

2.2.1 demographics questionnaire

Participants were asked to complete a brief demographic questionnaire, which included the following items: gender, age, how far in school (years), race and ethnicity, current marital status, and current GPA.

2.2.2 Barratt Impulsiveness Scale (BIS)⁸

The BIS is a 30-item self-report questionnaire that assesses three aspects of impulsive regulation: attentional, motor and non-planning impulsiveness. Attentional impulsivity measures quick shifts in ones attention and impatience with complications. Motor Impulsivity is the tendency to act in an instantaneous, unplanned way in response to stimuli. Non-Planning impulsivity is the lack of weighing long-term consequences. The BIS is rated from 1 (Rarely/ Never) to 4 (Almost Always/ Always). An example of an item is as follows: "*I do things without thinking.*" Higher scores on this measure indicate more impulsiveness.

2.2.3. Self-Control Scale (SCS)¹⁰

The SCS is a 36-item self-report questionnaire that assesses self-control in the following domains: self discipline, deliberate/non impulsiveness, healthy habits, reliability, and work ethic. This scale is rated from 1 (Not at all) to 5 (Very much). High scores on the SCS indicate more self-control. An example of an item is as follows: "*I am good at resisting temptation.*"

2.2.4. Eating Attitudes Test (EAT)⁴

The EAT is a 40-item self-report measure of traits of anorexia nervosa. It is rated based on a 6-point Likert Scale, ranging from 1 (Always) to 6 (Never). A sample statement is, "*I am preoccupied with a desire to be thinner.*" A score of 30 or above reflects traits of anorexia nervosa.

2.2.5. Eating Questionnaire-Revised (EQ-R)¹³

The EQ-R is a 15-item self-report measure of traits of bulimia nervosa. It is rated based on a 5-point Likert Scale, ranging from A (Seldom/Never) to E (Everyday, Always/More than one time per day). A sample question is as follows: "*How often do you binge eat?*" Higher scores on this measure indicate traits of bulimia nervosa.

2.2.6. Stop-It¹²

This is a computerized performance test designed to assess response inhibition to stop signals. Participants were presented with a series of visual stimuli along with an auditory stop signal, which would occur on a random selection of trials. Participants were instructed to respond as fast as possible to a stimulus, but they must inhibit their response when they heard the stop signal. Reaction time to the stop signal was the dependent variable. Higher levels of inhibition are associated with shorter latency and fewer numbers of errors committed.

3. Results

A series of multiple regression analyses were computed to predict maladaptive eating behaviors as a function of neurocognition, including impulsivity (i.e., attentional impulsiveness; motor impulsiveness; non-planning

impulsiveness), self-control, and inhibition (stop-signal reaction time). Table 1 depicts the regression coefficients for these analyses.

Traits of anorexia nervosa were regressed on the five predictors (attentional impulsiveness; motor impulsiveness; non-planning impulsiveness; self-control; and inhibition), using a simultaneous procedure. The regression was significant, $F(5,76) = 2.885, p = 0.019, R^2 = 0.16$. Among the predictors, attentional impulsiveness ($B = 0.645, t(87) = 2.119, p = 0.037$) and non-planning impulsiveness ($B = -0.510, t(87) = -2.236, p = 0.028$) were significant determinants of anorexia nervosa traits. In addition, motor impulsiveness ($B = 0.496, t(87) = 1.834, p = 0.071$) was a trend level predictor, whereas self-control ($B = -0.003, t(87) = -0.053, p = \text{n.s.}$) and stop-signal reaction time ($B = 0.003, t(87) = 0.353, p = \text{n.s.}$) did not emerge as significant predictors of anorexia nervosa traits.

Similarly, traits of bulimia nervosa were regressed on neurocognitive processes of attentional impulsiveness, motor impulsiveness, non-planning impulsiveness, self-control, and inhibition, using a simultaneous procedure. The regression was significant, $F(5,75) = 2.963, p = 0.017, R^2 = 0.167$. Among the predictors, non-planning impulsiveness ($B = -0.493, t(87) = -2.244, p = 0.028$) was the strongest determinant of bulimia nervosa traits, whereas attentional impulsiveness ($B = 0.566, t(87) = 1.925, p = 0.058$) and self-control ($B = -0.122, t(87) = -1.952, p = 0.055$) were at a trend level. Motor impulsiveness ($B = 0.174, t(87) = 0.663, p = \text{n.s.}$) and stop-signal reaction time ($B = -0.004, t(87) = -0.463, p = \text{n.s.}$) did not appear to be significant predictors of traits of bulimia nervosa.

Table 1. regression coefficients

	β	t	p
Eating Attitudes Test			
Self-Control Scale	-0.003	-0.053	0.958
Attentional Impulsivity	0.645	2.119	0.037*
Motor Impulsivity	0.496	1.834	0.071 ^t
Non-Planning Impulsivity	-0.510	-2.236	0.028*
Stop-Signal Reaction Time	0.003	0.353	0.725
Eating Questionnaire-Revised			
Self-Control Scale	-0.122	-1.952	0.055 ^t
Attentional Impulsivity	0.566	1.925	0.058 ^t
Motor Impulsivity	0.174	0.663	0.509
Non-Planning Impulsivity	-0.493	-2.244	0.028*
Stop-Signal Reaction Time	-0.004	-0.463	0.645

* $p < 0.05$ (two-tailed test); ^t $p = \text{trend level}$

4. Discussion

For the current study, we attempted to examine the neurocognitive determinants (attentional impulsiveness, motor impulsiveness, non-planning impulsiveness, self-control, and inhibition) of anorexia and bulimia nervosa traits in undergraduate students. In accordance with our predictions, findings from this study revealed significant relationships between impulsiveness and tendencies toward eating disorders. Also, as predicted, lower levels of self-control appeared to be associated with bulimia nervosa tendencies; however, these results were not statistically significant. Contrary to our expectations, inhibition was not a significant predictor of anorexia nor bulimia nervosa tendencies.

Specifically, non-planning impulsivity was the only significant predictor of traits of both anorexia and bulimia nervosa in the current sample. According to Lowe and Eldredge,⁷ "The symptom of binge eating usually occurs as an unplanned eating episode involving a feeling of loss of control and is thus experienced to have an impulsive quality." Our results also partially support those of Rosval et al.,⁹ which revealed non-planning impulsiveness to be characteristic of only individuals with bulimia nervosa tendencies.

Prior findings by Tangney, Baumeister, and Boone¹⁰ have demonstrated that a lack of impulse control can have an impact on the behavior of university students. Female students displayed more difficulties with food regulation, whereas male students suffered from alcohol abuse problems. In this study, attentional impulsiveness significantly predicted traits of maladaptive eating behaviors, specifically anorexia nervosa, which implies a strong relationship between cognitive impulsiveness and anorexia nervosa tendencies, as opposed to impetuous movements (motor impulsiveness). Our results are consistent with the findings of Lowe and Eldredge,⁶ which postulated that impulsivity predisposes individuals to the occurrence of eating disorders. Furthermore, a study conducted by Rosval

et al.⁹ revealed that eating disorder groups scored significantly higher on the attentional impulsivity dimension of the BIS⁸ than the non-eating disorder control groups, which implies that individuals with eating disorders experience cognitive impulsivity impairment.

Although self-control and inhibition were not significant predictors of anorexia and bulimia nervosa tendencies, self-control was found to be a trend level predictor for traits of bulimia nervosa. These data were not consistent with a study by Tangney, Baumeister and Boone,¹⁰ which found that higher levels of self-control reflected fewer difficulties in eating regulation. Impulse control problems have been linked to deficits in self-control, however we did not find significant relationships between these two neurocognitive domains and traits of eating disorders.

The current study has some limitations. First, we did not examine the role of personal characteristics or socioeconomic status among participants. These factors may play an important role in how and why eating disorders such as anorexia and bulimia arise. Interpersonal relationships and social factors could influence people's decisions regarding their eating patterns. Maladaptive eating behaviors would then be used as a compensatory method for managing social pressures and difficulties involving emotional regulation.

Second, although our sample size (n=88) yielded adequate statistical power, it was not fully representative of the general population. The participants in this study were predominantly female university students (80.68%) of Caucasian descent (51.14%). Since females appear to experience a higher rate of eating disorders,¹⁴ it seems possible that the current sample included a greater percentage of subjects with eating disorders than that found in the general population, thereby potentially skewing the results. Furthermore, it is not known whether the patterns of findings here would also apply to participants with a different racial and ethnic background.

Overall, our findings suggest that the neurocognitive function of impulsivity may serve as an important determinant of maladaptive eating behaviors. More specifically, non-planning impulsiveness or a lack of future orientation appeared to be the strongest factor in predicting traits of eating disorders. It seems possible that people with traits of anorexia and bulimia nervosa have the inability to weigh long-term consequences. Thus, future treatment programs for pathological eating might improve efficacy by targeting this specific aspect of neurocognition to help reduce recidivism rates. Our results may assist in identifying and predicting maladaptive eating patterns in order to construct prevention programs and prevent further development of eating disorders. Future research is also needed to better understand the relationships between maladaptive eating behaviors and people's social habits, family history, and physiological as well as environmental factors.

5. Acknowledgements

This research was supported in part by the Instructionally Related Activities Fund at California State University Channel Islands.

6. References

1. American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, D.C.: American Psychiatric Association.
2. Ibid.
3. Birgegård, A., Björck, C., Norring, C., Sohlberg, S., & Clinton, D. (2009). Anorexic self-control and bulimic self-hate: Differential outcome prediction from initial self-image. *International Journal of Eating Disorders*, 42(6), 522-530. doi:10.1002/eat.20642.
4. Garner, D. M. & Garfinkel, P. E. (1979). The Eating Attitudes Test: An index of the symptoms of anorexia nervosa. *Psychological Medicine*, 9, 273-279.
5. Garner, D. M., Olmstead, M. P., & Polivy, J. (1983). Development and validation of a multidimensional eating disorder inventory for anorexia nervosa and bulimia. *International Journal of Eating Disorders*, 2, 15-34.
6. Lowe, M. R. & Eldrege, K. L. (1993). The role of impulsiveness in normal and disordered eating, in McGowan, W. G., Johnson, J. L. & Shure, M. B. (Eds.) *The Impulsive Client: theory, research and treatment*, 185-224. Washington, D.C.: American Psychological Association.
7. Ibid. 201.
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The Effects of Children and Adolescents in Distress on Altruism: A Stroop Interference Study

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Abstract

Altruism has been viewed as a prosocial motivation of which the ultimate goal is to assist others in need of help. However, little is currently known about whether people's responses to viewing adolescents in distress would be comparable to those for children and infants in distress, particularly in individuals who display altruism. The current study examined the perception of children and adolescents in distress on Stroop interference in 40 undergraduate students with higher versus 38 students with lower levels of altruism. To our knowledge, this is the first research to utilize the Stroop interference procedure to assess altruistic behavior towards children versus adolescents in distress. Participants' responses (errors) and latency were assessed using a Stroop Interference Task, which involved identifying a colored dot (red, green, yellow, or blue) in a series of four types of images: children distress, adolescents distress, children/adolescent non distress, and color control. The Stroop interference procedure has been extensively used to demonstrate cognitive interference by measuring errors and latency in tasks that require attention to only one of two stimuli. Altruism was assessed using the Self-Report Altruism Scale. A series of t-tests revealed that individuals who displayed higher levels of altruism committed significantly more errors for the condition depicting adolescents in distress ($t(76)=-1.72, p=0.04$) and children in distress ($t(76)=-1.78, p=0.04$) compared to their counterparts who displayed lower levels of altruism. However, there were no significant differences between the groups on the number of errors made when viewing children/adolescent non-distress and color control. Furthermore, individuals with higher levels of altruism displayed longer latency for the condition depicting children/adolescents non-distress ($t(76)=-2.35, p=0.01$) compared to their counterparts. There were no significant group effects in latency for children distress, adolescents distress, and color control. Preliminary findings from this study may potentially increase our understanding of the role adolescents in distress on our cognition and altruistic acts in everyday lives.

Keywords: Adolescent Distress, Children Distress, Altruism

1. Introduction:

According to Myers⁶, altruism is concern or behavior motivated by an unselfish desire for the wellbeing of others. An altruistic person is concerned and helpful even when no benefits are offered or expected in return. In addition to helping, altruistic people are motivated to assist others in distress. However, recent literature involving altruism focuses mainly on reciprocal altruism, which is defined as when one helps another, help is expected in return⁷.

Previous studies have demonstrated higher intensity levels of grief over deceased adolescent children as opposed to infant children. In a study conducted by Crawford, Satler, and Jang², participants were given a scenario where two of their children of different ages had died due to a car accident and were asked to report which of the children they would experience greater loss for. Their results showed that the most amount of grief would be experienced by the loss of children between ages 15 to 25, with lower reports of grief for those were younger or older. These findings were congruent with the results from non-industrialized societies such as the !Kung Bushmen of Africa. Inferences can be made from an evolutionary psychology perspective that this pattern of findings is due to parental investment,

and the proximity of adolescents to the age of procreation². Although these results are interesting, little is currently known about whether responses for adolescents in distress would be comparable to those for children in distress in individuals who display altruism.

The aim of current study was to examine the effects of children and adolescents in distress on Stroop interference in individuals with higher versus lower levels of altruism. The Stroop interference procedure has been extensively used to demonstrate cognitive interference by measuring errors and latency in tasks that require attention to only one of two stimuli^{3,4,5,8}. Previously, the Stroop task was used to measure cognitive interference by the increase of time it took to name the presented color of a word where the word itself was the name of a color, but the word was written in a different color⁸. Over the years, the Stroop task has been modified to include other variables. For instance, some studies used words of different emotional valence and written in different colors. The results indicated that when asked to ignore the word and focus on the color, the word with a specific emotional valence continued to interfere with subject's ability to name the color of the word⁴. Other modifications of the Stroop Task included utilizing images with words written inside of the objects, which were found to create cognitive interference as well³.

To our knowledge, this is the first research to utilize the Stroop interference procedure to assess altruistic behavior towards children versus adolescents in distress. Based on previous literature, we hypothesized that errors and latency made for images of adolescents distress would be higher compared to images for other conditions of children distress, children/adolescent non-distress, and color identification. We also predicted that individuals who displayed higher levels of altruism would have more errors and higher latency for images of adolescents distress compared to those who displayed lower levels.

2. Method:

2.1 participants:

Seventy-eight undergraduate students (40 females, 38 males) from California State University Channel Islands were recruited and tested for this study. The average age of participants were 25.50 years (SD=5.39). Participants were categorized into two groups: individuals with a higher level of altruism (n = 40) versus those with a lower level of altruism (n = 38). Demographic characteristics for participants are summarized in Table 1. Participation was voluntary and encouraged by the incentive of extra credit. Informed consent was obtained from each participant using both written materials and verbal description.

Table 1: Demographic Data

	Higher Altruism	Lower Altruism
Age (Mean)	25.48 (SD=4.88)	25.53 (SD=5.89)
Gender		
Male	23	15
Female	17	23
Race/Ethnicity		
Caucasian	25	14
Hispanic	10	20
Asian	1	2
Other	4	2

2.2 materials and procedures:

All participants were asked to complete a brief demographic questionnaire, a Stroop interference task involving images of children and adolescents in distress and non-distress, and a Self-Report Altruism Scale⁷. Testing took an average of 30 minutes to complete:

2.2.1 Stroop Task

The effects of children and adolescents in distress were assessed using a Stroop Interference Task. A total of 48 images, with a colored circle (red, green, yellow, or blue) superimposed on each image, were categorized into one of four conditions: children distress, adolescent distress, children/adolescent non-distress, and color control that consisted entirely of the colors red, green, yellow, or blue. Participants were instructed to identify the color of the circle in each image as quickly as possible by pressing one of four keys on a keyboard placed in front of them. Prior to the experimental trials, each participant completed a Stroop practice test that allowed them to memorize the four number keys that correspond to each of the four colors (2= Red, 4= Green, 8= Yellow, 0= Blue). A total of five conditions were counterbalanced across participants and a total of twenty-four trials were presented at random for each condition. Errors and latency for incorrect responses served as the dependent variables.

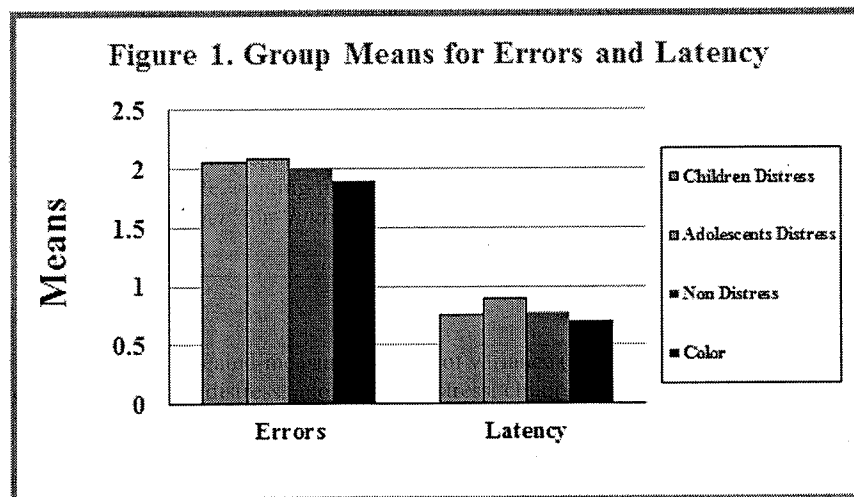
2.2.2 The Self-Report Altruism Scale (SRAS)⁷

Altruism was assessed using the Self-Report Altruism Scale (SRAS)⁷. The SRAS consists of 20 self-report items, and is rated on a 5-point Likert scale, ranging from 1=never to 5=very often. An example of the item is as follows: "I have given directions to a stranger" or "I have donated blood."

3. Results:

As seen in Figure 1, a one-way repeated-measure analysis of variance (ANOVA) revealed that the Stroop interference conditions of children distress, adolescents distress, children/adolescent non-distress, and color (control) showed no significant difference for the amount of errors made, $F(3,164)=0.38, p=n.s.$

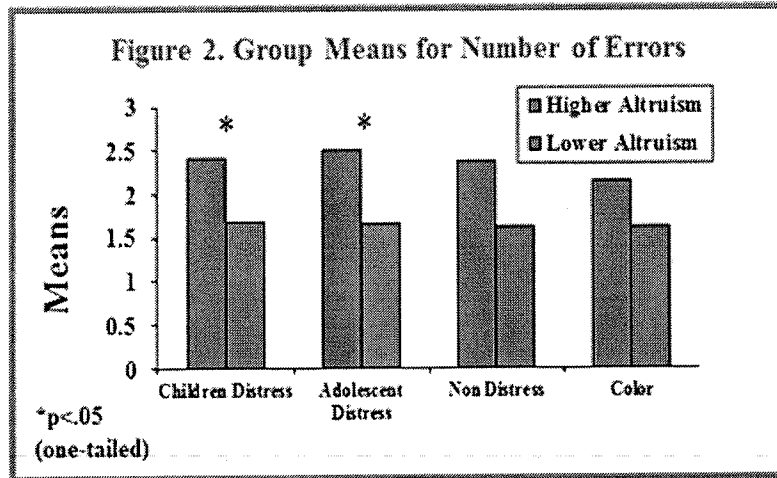
Similarly, for the reaction time of incorrect answers, a one-way repeated-measure ANOVA revealed that the Stroop interference conditions of children distress, adolescents distress, children/adolescent non-distress, and color control did not show a significant difference, $F(3,164)=1.99, p=n.s.$



A series of t-tests were computed to analyze group differences between individuals with higher and lower levels of altruism on number of errors made and latency of incorrect responses in the four conditions of children distress, adolescent distress, children/adolescent non-distress, and color control.

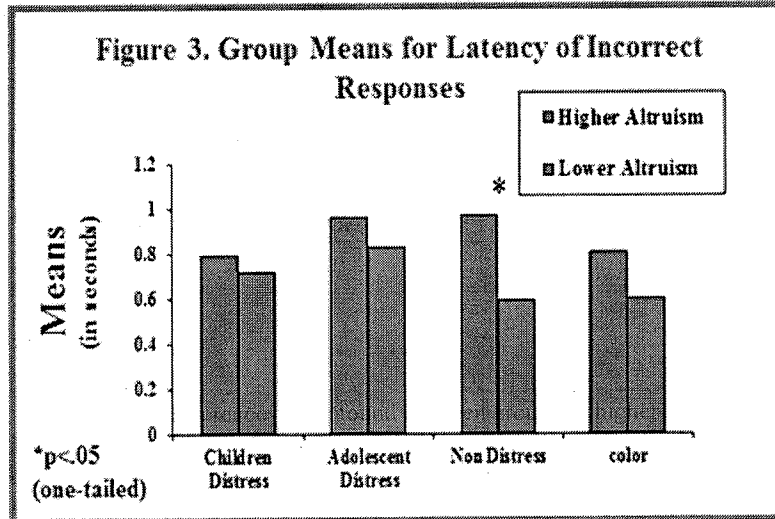
Number of Errors

Figure 2 shows that participants with high levels of altruism and low levels of altruism differed significantly in the number of errors made in the children in distress condition ($t(76)=-1.78, p=0.04, \text{Cohen's } d=0.4$) and adolescents in distress condition ($t(76)=-1.72, p=0.04, \text{Cohen's } d=0.39$). However, there were no significant differences between the groups on the number of errors made when viewing children/adolescent non-distress ($t(76)=-1.53, p=n.s., \text{Cohen's } d=0.35$) and color control ($t(76)=-1.23, p=n.s., \text{Cohen's } d=0.28$).



Latency of Incorrect Responses.

As seen in Figure 3, no significant differences were found between groups of higher and lower altruism in their reaction time for incorrect answers for children in distress ($t(76)=-0.71, p=n.s.,$ Cohen's $d=0.16$) and adolescents in distress ($t(76)=-0.84, p=n.s.,$ Cohen's $d=0.19$). However, the group showed a significant difference in latency for the condition depicting children/adolescent non-distress ($t(76)=-2.35, p=0.01,$ Cohen's $d=0.53$) and a trend level for the color control condition ($t(76)=-1.41, p=0.08,$ Cohen's $d=0.32$).



4. Discussion:

The purpose of this study was to examine the effects of children and adolescents in distress on Stroop interference in individuals with higher versus lower levels of altruism. Contrary to our predictions, the findings revealed that individuals in our sample committed essentially a comparable amount of errors (i.e., cognitive interference) and latency for images of adolescents in distress compared to the other conditions depicting images of children in distress, children/adolescent non-distress, and color identification (control). Results from this study were not congruent with those of Crawford, Satler, and Jang², which demonstrated that people would experience significantly higher levels of grief for deceased adolescent children versus infant children.

In addition, in the current sample, people who displayed higher levels of altruism committed significantly more errors (i.e., cognitive interference) not only when viewing images depicting adolescents in distress, but also when viewing images of children in distress compared to their counterparts who displayed lower levels of altruism. These findings do not fully support the evolutionary perspective that the impact of adolescents' death on parents was more significant compared to the death of infant children because their age range is closer to the age of procreation².

Interestingly, individuals who displayed higher levels of altruism exhibited significantly longer latency for children/adolescent non-distress and a trend-level difference for color control compared to those who displayed lower levels of altruism. Although not statistically significant, the higher levels of the altruism group also appeared to take more time to respond compared to the lower levels sample when viewing images depicting children in distress and adolescents in distress.

One possible interpretation for this significant difference is that individuals with lower altruism might attempt to escape from the situation. Batson et al.¹ have identified two distinct motivations that people tend to follow when witnessing others in distress. Those with egotistic motivation try to reduce their personal distress by escaping the situation whenever possible, whereas those with altruistic motivation reduce their distress by helping others who they witness are experiencing distress; therefore they do not tend to escape stressful situations. Our results demonstrated that people with lower levels of altruism responded significantly faster when viewing non-distress images. These neutral images may be seen as the right opportunity to escape the situation faster since they do not cause any personal distress or interfere with their cognition.

The current study has some limitations. First, although twelve pictures were used per condition, the presentation of these pictures was randomly selected by the Stroop test software. In some trials, the same images were presented repeatedly. This repetition of images could have potentially skewed the response time because participants were able to identify the color more accurately and faster in such a procedure.

Second, characteristics of the participants in this study may also have influenced our results. Our sample consisted primarily of undergraduate students who were not married and did not have children, which precluded examination of potential differences in altruistic behavior towards children versus adolescents in distress among subjects who have children versus those without children. In contrast, previous research by Crawford, Satler, and Jang² tested subjects who were parents to observe if grief was associated with their children's reproductive value.

Third, gender differences may have affected the results, with the higher altruism group having more males, and the lower altruism group having more females. The current study did not aim to examine the role of gender differences; however data are currently being collected to test the potential effects of gender variations on viewing children and adolescents in distress using identical procedures.

To our knowledge, this is the first research to utilize the Stroop interference procedure to assess altruism towards children versus adolescents in distress. Overall, the current findings may potentially increase our understanding of the role children and adolescents in distress on our cognition and altruistic acts in everyday life.

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