Activating Unemployed Job Seekers Toward Volunteering

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Keywords

Altruism, anxiety, approach, avoidance, Approach Avoidance Task, AAT, AAT training, Implicit Association Test, IAT, SC-IAT, single category implicit association test, social anxiety, re-employment, unemployment, unemployed, volunteering, volunteer, VFI, volunteer functions inventory

Abstract

Unemployment is a devastating experience that can result in poor mental and physical health and reduced wellbeing. Deterioration of social networks and loss of other secondary benefits previously provided by employment may lead to increased social anxiety and isolation. Unemployed individuals with social anxiety may exhibit fewer approach behaviours toward activities that contribute to overall wellbeing and increased likelihood of re-employment. Research shows that volunteering can be a pathway to re-employment and provide similar social and psychological benefits as employment, but also shows that unemployed individuals are less likely to volunteer.

Approach Avoidance Task (AAT) training has been effective in improving implicit and explicit attitudes toward stressful stimuli and enhancing approach behaviours toward beneficial activities. The present research examines if one-time AAT training in approaching images of volunteering will positively influence implicit and explicit evaluations by unemployed jobseekers toward volunteering, as measured by the single category implicit association test (SC-IAT), self-reported measures of feelings toward and intention to volunteer and behaviours toward volunteering.

Results from a broad sample of English speaking, unemployed job seekers between the ages of 18 and 65 from North America, Europe, and Oceania did not support the five hypotheses in this study. Although procedures as designed did not show a significant, positive, treatment effect, initial exploratory analysis indicates avenues for further investigation.

This research contributes to developing AAT training literature in investigating applications in vocational and volunteering domains. Further empirical evidence is required to fully understand how AAT training could be used in these applications. It is hoped that this research and further recommendations encourage others to investigate the potential of AAT training in these domains.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Contents

Abstract.....	1
Introduction	5
1. Literature Review	6
Experience of Unemployment	6
Unemployed Time Use.....	7
Isolation and Anxiety as Barriers to Volunteering and Overcoming Social Anxiety	8
Enhancing Approach Motivations – AAT Training	8
2. Conceptual Framework	9
3. Research Objectives and Hypotheses	10
4. Research Design & Methodology	11
Open Science	11
Sampling	12
Participants & Recruitment.....	12
Experimental Design	13
Procedures and Measures	15
Approach and Avoidance Task (AAT) Training.....	15
Dependent Variables.....	17
Control Variables.....	19
5. Results.....	20
Preliminary Analyses	20
Overall Effect Sizes	21
Tests for Normality.....	21
Statistical Test of Null Hypotheses	22
Hypothesis 1: Implicit Evaluation of volunteering (SC-IATD).....	22
Self-Reported Measures	22
Hypothesis 5: Behavioural Click-Through (BeCT)	23
Regression Analysis	23
6. DISCUSSION.....	27
Possible Explanation of results.....	27
Context Matters	27
Experimental Limitations	28
Alternate Mechanisms – Altered Procedures	29
Future Recommendations.....	30
General Study Limitations	31

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Study Controls.....	31
External Validity	31
Conclusion.....	32
References	34
Acknowledgements.....	39
Appendix A: AUJSTV Experimental Design & Procedures	40
Short-Five (S5) Altruism Scale	40
Approach-Avoidance Task (AAT) Training Procedure.....	41
Single Category Implicit Association Test (SC-IAT) Procedure.....	41
Explicit Measures	41
Behavioural Click-Through Task (BeCT), to test H5+	42
Volunteer Functions Inventory (VFI) and Self-Reported Long-Term Intent to Volunteer (LTI2V).	43
Debrief & Opt-Out.....	48
Appendix B: Data Exclusion Procedures	49
Appendix C: Statistical Analysis	51
Dependent Variable correlations to Control Variables	51
Correlation – Volunteer Functions Inventory Items and VFI Mean.....	52
Detailed Statistical Analysis – Dependent Variables	52
Reactance and Demand Characteristics.....	52
Appendix D: Post-Hoc Power Analysis.....	54
Appendix E: Specifications for Approach Avoidance Task Module in GORILLA™	55
Keyboard Based AAT Specification Document	55
Image Scaling	55
Keyboard Inputs – Participants press arrow keys multiple times.....	56
Sideways AAT - Neutral Treatment Left and Right Movement	57
US and UK Desktop Screen Resolution 2018-2019	59
Outcome: GORILLA™ AAT Zone Beta	60
Appendix F: Volunteer Stimuli for AAT and IAT.....	62
Experimental Design & Procedures.....	62
Measures	62
Statistical Analysis of Volunteer Stimuli	63
Ranking of Images.....	65
Appendix G: Stata® Do-file Commands	66
1. Primary Statistical Analysis Stata® Do-file	66
2. Data Exclusion – Stata® Do-file	76

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

3. Validating Volunteer Stimuli – Stata® Do-file	79
Appendix H: Exploratory Analysis	82
Age, Gender, and Regional Differences on Implicit Evaluations	82
Significant Reverse Effects in One Subgroup.....	83
Interaction Effects - Treatment Group##Country	83
SC-IATD Block Randomization Order.....	85

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Introduction

Unemployment is shown to have a negative impact on general self-esteem, mental and physical health, happiness, and subjective well-being. Volunteering provides an opportunity to re-build social connections and self-esteem, contribute to a common goal, and may provide a path to reemployment. Despite this, unemployed individuals are less likely to volunteer. This study is about understanding if a simple intervention can reduce the misery and destructive impacts of unemployment.

Recently a collapse in petroleum prices lead to significant involuntary job losses in the energy industry. Between 2015 and 2016 there were more than 350,000 layoffs in this sector globally (Daiss, 2016; DiChristopher, Wells, & Schoen, 2016). After spending 22 years in this industry, I have experienced these downturns first-hand and believe that behavioural science can help the unemployed engage in activities that support their overall wellbeing and path to re-employment.

The objective of this research is to validate if a single session of positive approach, approach avoidance task (AAT) training is an effective intervention for activating unemployed job seekers toward the activities that will reduce isolation, support wellbeing, and ultimately lead back to re-employment. Specifically, will it increase implicit evaluations, explicit self-reported measures, and behaviours toward volunteerism. This research extends existing literature by looking at a novel application of AAT training in the vocational and volunteering domains.

This paper is organized as follows: Section 1 reviews a selection of literature examining the experience of unemployment and how these individuals use their time. This is followed by a review of volunteer motivators and potential benefits of volunteering during unemployment. Lastly, it looks at strategies to overcome the anxiety and isolation associated with unemployment. Section 2 introduces a conceptual experimental framework and research question from which the design and methods in section 3 were selected. Section 4 reviews and analyzes key experimental results. Section 5 discusses findings, limitations, contributions, and areas of future investigation based on outcomes of this study. The final section summarizes pertinent conclusions and frames outcomes of this research against continued developments of AAT training and ongoing work in behavioural science.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

1. Literature Review

This section reviews a selection of literature broadly covering unemployment and volunteering. It explores the experience of unemployment, how the unemployed use their time, and looks at volunteering as beneficial activity and a pathway re-employment. It looks social isolation and diminished approach common to the unemployed and investigates AAT training as a potential intervention to enhance approach motivations.

Experience of Unemployment

From global measures and numerous studies of wellbeing, we know that unemployment has devastating impacts on overall subjective wellbeing, health, and happiness (Clark, 2009; Dolan, Layard, & Metcalfe, 2011; Lucas, Clark, Georgellis, & Diener, 2004; O' Donnell, Deaton, Durand, Halpern, & Layard, 2014; Paul & Moser, 2009). Effects of being unemployed are on par with a loved one dying and are shown to have a continuing negative impact on wellbeing, even after returning to work. Recent evidence from the Great Recession shows a link between mass unemployment and an overall deterioration of mental and physical health (Farré, Fasani, & Mueller, 2018). In general, the unemployed are less confident and can feel overwhelmed by every-day life problems (Hoare & Machin, 2013; Paul & Moser, 2009). Financial strains and social stigma of unemployment lead to greater isolation and social anxiety as former employment-based support networks begin to degrade. (Bartley, 1994; Gallie, Paugam, & Jacobs, 2003).

On her research of mass unemployment during the Great Depression, Jahoda established that beyond earning a living, employment provides unintended social and psychological benefits including: opportunities for social contact, participation in a collective purpose, social status and a measure of personal worth, structured time, and ongoing activity (Fryer, 1998; Hoare & Machin, 2013; Jahoda, 1982; Paul & Batinic, 2010). She argued that loss of these benefits, in addition to loss of income, causes mental anguish and stress in the unemployed. Fryer also argued that loss of income results in reduced individual control over one's life and future due to lack of choices (Fryer, 1998; Hoare & Machin, 2013).

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Unemployed Time Use

Unemployed individuals use approximately 6% of their day actively looking for work, and most of their spare time on leisure activities, housework, and care of others (see figure 1, adapted from Krueger & Mueller, 2012). What unemployed people do with their time is important to their well being. Participating in meaningful activities can

Figure 1: Time use of Employed and Unemployed Individuals, adapted from Krueger & Mueller, 2012a, table 1)

help individuals feel connected, less isolated, and more in control, which can improve mental wellbeing (Hoare & Machin, 2013; Kamerāde & Paine, 2014). Socializing, exercise and sport, learning new skills, care of others, and volunteering can be meaningful. Important social and psychological benefits that employment once provided can be met through these activities; the following sections investigate this further.

Volunteering – A Pathway to Engagement and Re-employment

Volunteering is a persistent theme in policy and programs supporting job seekers efforts to return to work. Longitudinal studies show time spent volunteering is correlated with faster re-employment, although results have been mixed in some jurisdictions (Paine, McKay, & Moro, 2013; Spera, Ghertner, Nerino, & Ditommaso, 2013). Volunteering supports re-employment by helping individuals re-build professional networks, uncover employment leads, develop skills, and gain work experience (Spera et al., 2013).

Low demand environments with mass layoffs can make finding new work a long process. Volunteering can provide the benefits that Jahoda attributed to employment, such as: structured time, collective purpose, building social ties, and using existing or developing new skills. Volunteer work, which society values, provides individuals with an identity other than “unemployed” (Kamerāde & Bennett, 2015). Importantly, volunteering can help

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

people avoid social isolation and is shown to reduce depressive symptoms. It has a positive influence on mental health, lowers levels of mortality, and increases life satisfaction and overall wellbeing (Musick & Wilson, 2007). Helping others improves self-concept and provides purpose which further supports mental health.

Research shows that unemployed people volunteer less than part-time or full-time employees, although evidence is mixed (Kamerāde & Bennett, 2015; Piatak, 2016). Newly unemployed focus on active job search and may not consider volunteering as an obvious path to re-employment. Individuals facing extended unemployment are less likely to volunteer because of feelings of detachment and insecurity. Loss of status and social capital lead unemployed individuals to disengage and feel like they have little to offer that would be helpful to others (Baum, Fleming, & Reddy, 1986; Musick & Wilson, 2007; Piatak, 2016). Unemployment can create feelings of inadequacy, loss of confidence, and a sense of being overwhelmed by every-day problems, often resulting in increased social anxiety. As this extends, these stresses and financial strain can result in fewer social activities, truncated social ties, and individual isolation (Gallie et al., 2003; Musick & Wilson, 2007; Piatak, 2016). The next section discusses the implications of the isolation and social anxiety that often is experienced with joblessness.

Isolation and Anxiety as Barriers to Volunteering and Overcoming Social Anxiety

Social anxiety is commonly experienced as a conflict between approach and avoidance (Lester et al., 2015; Rinck et al., 2013; Taylor & Amir, 2012). Individuals express a desire for social connection, but this is offset by a fear of rejection. As discussed previously, social anxiety can develop from social isolation commonly experienced with unemployment. Individuals who are experiencing social anxiety may exhibit fewer approach behaviours toward activities that will contribute to overall wellbeing and increased likelihood of reemployment, like volunteering.

Figure 2, constructed as a summary of processes discussed above (Baum et al., 1986; Campbell et al., 2009; Gallie et al., 2003; Musick & Wilson, 2007; Piatak, 2016; Rinck et al., 2013), illustrates a path from unemployment to social isolation, social anxiety, and diminished approach (via lack of resources and reduced social contact). This diminished approach condition can further reduce social contact and reinforce cycles of social isolation and anxiety.

Figure 2: From unemployment to isolation, social anxiety, and diminished approach

It is not that the unemployed avoid beneficial behaviours per se. They have a diminished approach orientation toward these activities because of social anxiety and isolation.

Enhancing Approach Motivations – AAT Training

All animals, including humans, have rudimentary brain systems that automatically influence approach toward positive stimuli and away from harmful or negative stimuli (Cacioppo, Priester, & Berntson, 1993; Chen & Bargh,

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

1999; Solarz, 1960). Any stimulus is evaluated on a good or bad dimension almost instantaneously and an immediate approach or avoidance response occurs (Elliot & Covington, 2001). Approach and Avoidance Task (AAT) is an indirect, experimental method that measures intrinsic approach or avoidance evaluations of visual stimuli based on this automatic response (Rinck & Becker, 2007).

Evidence suggest that approach motivations can be modified using Approach Avoidance Task (AAT) training (Kawakami, Phills, Steele, & Dovidio, 2007; Kawakami, Steele, Cifa, Phills, & Dovidio, 2008; Rinck & Becker, 2007; Taylor & Amir, 2012). AAT training effects are thought to be due to repeated positive or negative exposure creating associations within these rudimentary motivational systems that are called on when stimuli are being evaluated (Van Dessel, Eder, & Hughes, 2018). AAT training has been effective in reducing approach behaviours toward unhealthy choices, likely eating poorly, smoking, and drinking alcohol (Kakoschke, Kemps, & Tiggemann, 2017; Van Dessel, Hughes, & De Houwer, 2018). It has also been effective in enhancing positive approach behaviours toward people, for individuals with social anxiety disorder (Taylor & Amir, 2012), improving implicit attitudes toward other races (Kawakami et al., 2007), and improving explicit evaluations of stressful stimuli (Huijding, Muris, Lester, Field, & Joosse, 2011; Lester et al., 2015; Woud, Maas, Becker, & Rinck, 2013). In more novel examples, AAT training has been effective in enhancing approach toward exercise and also mathematics (Cheval, Sarrazin, Pelletier, & Friese, 2016; Kawakami et al., 2008). These are examples of complex behaviours influenced through changing underlying associations toward an action or behaviour.

This study investigates if AAT training can be used to activate job seekers to overcome social anxiety and isolation effects of unemployment and increase approach tendencies toward volunteering.

2. Conceptual Framework

This study is rooted in a curiosity about why unemployed individuals do not engage in activities that support their wellbeing and a potential path to reemployment. Unemployed volunteers represent an untapped economic resource. If half of US job seekers who do not currently volunteer did so for one minute a month, it would provide 1.2 million hours of work (current US unemployment rate of 3.6%, Bureau of Labor Statistics, 2019). Beyond pure economics, this study is about understanding how to lessen impacts of unemployment on individuals and their families through behavioural science.

The goal of this study is to examine whether one-time training in approaching images of volunteering can influence positive associations of unemployed jobseekers toward volunteering. It is expected that this will result in improved implicit and explicit evaluations of volunteering, explicit intent to volunteer in the near and long-term, and ultimately influence behaviours toward volunteering.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Figure 3 illustrates the conceptual framework of this study. Experimental manipulation is through AAT training, where images of volunteering are presented in sideways (control) and approach (treatment) weightings. The

Figure 3: Conceptual framework for the study

experiment is structured to measure implicit evaluations of volunteering (H1+), explicit self-reported attitudes toward volunteering (H2+) and intent to volunteer (H3+). Participants may not believe that they have time to volunteer now, but an increased positive evaluation may result in an increased interest in volunteering in the future, thus a measure for long-term intent to volunteer (H4+) has been included to account for this. Lastly, the experiment includes a behavioural task (H5+) to measure if the positive experimental manipulation also leads to positive actions toward

volunteering.

There are many reasons why an unemployed individual may or may not volunteer. As unemployment and volunteering are both complex experiences, evaluating the evidence from the dependent variables in isolation would be difficult. The literature suggests that how unemployment is experienced and motivations to volunteer vary with age and by sex, as well as by trait and state variables like altruism, unemployment duration, country of residence, and education level. These along with a measure of volunteer motivation should be included as control variables.

3. Research Objectives and Hypotheses

Unemployment is shown to have a negative impact on general self-esteem, mental and physical health, happiness, and subjective well-being. Volunteering provides an opportunity to re-build social connections and self-esteem, contribute to a common goal, and may provide a path to reemployment. Despite this, unemployed individuals are often shown to be less likely to volunteer.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

The objective of this research is to validate if a single session of positive approach training is an effective intervention for activating unemployed job seekers toward the activities that will reduce isolation, support wellbeing, and ultimately lead on a path back to reemployment.

Research Question: Will a single session of volunteering focused, positive-approach training using the Approach Avoidance Task increase implicit evaluations, explicit self-reported measures, and behaviours toward volunteerism with unemployed jobseekers.

Positive approach training toward volunteering using the Approach Avoidance Task (AAT) will result in more favourable:

- **Hypothesis 1 (H1+):** implicit evaluations of volunteering;
- **Hypothesis 2 (H2+):** explicit evaluation of feelings toward volunteering;
- **Hypothesis 3 (H3+):** self-reported intent to volunteer;
- **Hypothesis 4 (H4+):** self-reported long-term intent to volunteer; and
- **Hypothesis 5 (H5+):** an increased rate of clicking a link about volunteering in their home city (behavioural task);

as compared to individuals in a control group exposed to a neutrally weighted AAT.

4. Research Design & Methodology

To evaluate the impact of positive approach training toward volunteering using the AAT, the current research used an online randomized control experiment (RCE). This design is gaining favour with researchers for the ability to scale and recruit a broader panel of participants beyond what could be attracted to a physical research lab. The study employed minor deception in that it did not reveal the intent of the experimental manipulation during the procedure. This was revealed during a post study debrief, at which time participants could revoke consent while still getting compensated for their time. The experiment was designed in compliance with the Research Ethics Policy and Code of Research Conduct of the London School of Economics and Political Science and approved by the Department of Psychological and Behavioural Science.

Open Science

All procedures, data, and materials are available through Open Science Framework

(https://osf.io/s38dx/?view_only=1f4b195d34a24901a5f2c8d299da87d3). Experiments, tasks, questionnaires, and scripts are shared through GORILLA™ Open Materials (<https://gorilla.sc/openmaterials/50453> and <https://gorilla.sc/openmaterials/42114>).

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Sampling

Power analysis was completed a priori in G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) using a two-tailed difference between two independent means (two groups) t-test, with a level of significance, $\alpha = 0.05$, power (β) = 80%, and estimating a between-subjects effect size (Cohen's d) of 0.3 based on analogous studies (Kakoschke et al., 2017; Van Dessel, Hughes, et al., 2018). To be sufficiently powered, each arm of the experiment requires 183 participants (366 total). An additional 38 participants (10%) should be recruited for expected data exclusions (404 total).

Participants & Recruitment

Participants were 404 unemployed job seekers between the ages of 18 and 60 recruited through prolific.co (Palan & Schitter, 2018). Candidates were fluent English speakers from the UK, European countries, Canada, United States, Australia, New Zealand, and Hong Kong. A broad group of source countries were used to ensure that an appropriately sized panel of unemployed job seekers could be recruited. Figure 4 outlines the flow of participants from enrollment through to analysis, with exclusions and criteria annotated by stage (Schulz, Altman, & Moher,

Figure 4: CONSORT flow diagram of RCE and exclusions

2010). Of the 465 prospects that enrolled in the experiment, 61 were excluded due to time-outs and participants choosing to opt-out mid-experiment. These data were considered to have consent revoked and were not included in files provided by the recruitment and experimental platforms, leaving the final 404 participants. Of these, data from 33 participants were excluded from analysis, 25 of which had an SC-IAT error rate of greater than 20% or had more than 10% of responses faster than 350ms (Greenwald, Nosek, & Banaji, 2003; Karpinski & Steinman, 2006). Two (2) participants were flagged with unsanctioned UP and LEFT responses (>22%) on the AAT. One of these participants had already been removed under the SC-IAT exclusion criteria, the other was excluded

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

for not following instructions / having a high AAT error rate (see: Kawakami et al., 2007, 2008; Krishna & Eder, 2018; Woud et al., 2013). A final seven (7) participants were removed using a three-hurdle criteria where exclusion occurred if three of the following items were flagged: maximum long string, Mahalanobis distance, person correlation by items, person correlation by subscale, or inter-item standard deviation on the Volunteer Functions Inventory (VFI) 30-item scale (Buchanan & Scofield, 2018; Curran, 2016; Kantor, 2006; Marjanovic, Holden, Struthers, Cribbie, & Greenglass, 2015; Meade & Craig, 2012; Steedle, 2018). The final sample consisted of 371 participants (190 females, 181 males), randomized into the Control (n=180), and Treatment (n=191) groups (see Appendix B for data exclusion procedures).

Experimental Design

The study was designed as an online between-subjects randomized controlled experiment (RCE) with two conditions built using the GORILLA™ platform (Anwyl-Irvine, Massonnié, Flitton, Kirkham, & Evershed, 2019) and following the high-level structure presented in figure 5.

Figure 5: Experimental Design (Adapted from Kawakami et al., 2008; Taylor & Amir, 2012; Van Dessel et al., 2018)

Participants in both groups completed informed consent, a demographics questionnaire, and the Short 5 (S5) Altruism Scale (Konstabel, Lönnqvist, Walkowitz, Konstabel, & Verkasalo, 2012) then were randomly assigned (balanced ratio (4), without replacement) into control and treatment groups using a *randomiser* node in GORILLA™. Participants in the treatment group completed an AAT designed to increase approach tendencies toward volunteering by pulling volunteer stimuli toward themselves for the majority (90%) of trials. Those in the control group completed a neutral AAT that balanced volunteer and neutral stimuli, selected from IAPS, (Lang Bradley, M.M., & Cuthbert, B.N., 2008), over all trials. All participants completed a single category implicit association test (SC-IAT) (Karpinski & Steinman, 2006) to measure implicit evaluations of volunteering, and answered questions to measure explicit attitudes toward volunteering and intent to volunteer. This was followed by a behavioural measure, presented as an opportunity to click on a link and learn about volunteering opportunities in the participant's home city. All participants completed the thirty question Volunteer Functions

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Inventory (VFI) and indicated long-term intent to volunteer. Participants completed validation questions to measure demand characteristics and reactance related to self-reported measures. Lastly, participants were debriefed on the minor deception present in the study and allowed to revoke consent if they wished.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Procedures and Measures

See Appendix A for more detail on experimental procedures.

Approach and Avoidance Task (AAT) Training

The experiment was designed as positive approach training using the AAT, adapted from Kawakami et al. (2007, 2008) and Taylor & Amir (2012) where the weighting of “pulling” images of volunteering toward the participant was manipulated by group. As shown in table 1, participants in the control condition completed an evenly weighted AAT that balanced pulling of volunteer and neutral stimuli with sideways movement of the same. The AAT in the treatment condition was designed to increase approach tendencies toward volunteering. Participants in this group were required to pull volunteer stimuli toward themselves for the majority (90%) of trials.

Table 1: AAT Control and Treatment trials by block. Trial order was randomized within blocks. Treatment group trials were weighted 90% Volunteer, Green Frame, answer: down/pull versus 50% for control group.

Group	Block	Trials	Answer		Volunteer Image		Neutral Image	
			Down/Pull (Gr Frame)	Right (Tan Frame)	Green Frame	Tan Frame	Green Frame	Tan Frame
Control 50% weighted Volunteer pull/neutral	Practice	2	1	1	0	0	1	1
	1	20	10	10	5	5	5	5
	2	20	10	10	5	5	5	5
	3	20	10	10	5	5	5	5
	4	20	10	10	5	5	5	5
Treat 90% weighted Volunteer pull	Practice	2	1	1	0	0	1	1
	1	20	10	10	9	1	1	9
	2	20	10	10	9	1	1	9
	3	20	10	10	9	1	1	9
	4	20	10	10	9	1	1	9

AAT avoidance trials were replaced with sideways trials as the intent was to manipulate automatic approach toward volunteering and not to avoid an opposing concept. Using sideways trials versus pushing neutral images should dampen any impact that avoidance may have on the positive manipulation toward volunteering (Taylor & Amir, 2012).

Volunteer stimuli for the AAT were sourced from a pre-study (see Appendix F) in which images of volunteering were selected based on proportion categorized as “volunteering”, and rating of images for category fit. Neutral stimuli were selected from the International Affective Picture System (IAPS) (Lang Bradley, M.M., & Cuthbert, B.N., 2008) using images that were +/- 0.5 SD from the mean arousal and valence scores of all images. Consistent with Taylor and Amir (2012), image frame color was used as an indicator to guide the direction of movement.

Participants were instructed that for each picture, they should push the down arrow if the border was green and push the right arrow if the border was tan. The instructions emphasized that participants should respond to the picture frame color and not the content of the image.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Participants were provided specific instructions on how to position fingers on the keyboard to ensure consistency and then completed 2 practice trials with hints to ensure they understood the instructions.

For both the control and treatment conditions, participants completed 2 practice trials followed by 80 test trials using (5 x pictures x 2 types (volunteer, neutral) x 2 border color (green, tan) x 4 repeat blocks ~5mins. Trials were randomized within each block by participant.

To begin each block, participants pressed the space bar, and were presented with a 400px X 300px image with a 15 px border in the center of the screen. On each down arrow key stroke (pull), images were scaled up and resized proportionally, simulating approach response. After four keystrokes, the image disappeared. During the sideways (right arrow key) movement the size of the picture remained constant, and the horizontal location was shifted by 171px to the right for each keystroke. The image disappeared after 4 keystrokes.

Treatment Condition

In the treatment condition, 90% of trials with volunteer pictures were framed in green, and thus presented as to be correctly pulled toward participants, versus 10% of volunteer images framed in tan, which were to be moved sideways. This ratio was reversed for neutral images, with only 1 in 10 pictures framed in green (pull), and the remaining 9 images framed in tan (sideways).

Control Condition

The control condition followed the same experimental procedure as treatment except that frame colors were balanced between green and tan for both volunteer and neutral images, thus positive and neutral trials were equal in each block.

Building the Approach Avoidance Task Module in GORILLA™

GORILLA™ provided the greatest flexibility in building and running this experiment online but did not have a suitable module to for the AAT. I developed a keyboard-based AAT design specification (see Appendix E) that would accommodate approach, avoidance, and sideways trials based on published literature (De Houwer, Crombez, Baeyens, & Hermans, 2001; Kawakami et al., 2007, 2008; Krieglmeier & Deutsch, 2010; Rinck & Becker, 2007; Taylor & Amir, 2012). The GORILLA™ consultancy team developed the beta AAT zone based on this specification and it is available to all behavioural scientists on the GORILLA™ platform. AAT procedures used in this experiment have been shared via GORILLA™ Open Materials (<https://gorilla.sc/openmaterials/50453>).

Volunteer Stimuli

As there were no pre-existing studies that validated volunteer stimuli for AAT and IAT, a pilot study (see Appendix F) was adapted from Russo et al. (2018) where participants were asked to categorize pictures into common daily activities (adapted from DePaulo, 2019), including volunteering. Participants rated how well the image matched

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

the category selected on a Likert scale of 1-7. A within-subjects analysis was completed to identify the top images by proportion categorized as volunteering, rating, and reaction time.

Dependent Variables

Single Category Implicit Association Test (SC-IAT)

Adapted from Karpinski and Steinman (2006), the SC-IAT is an appropriate method to measure automatic evaluations toward volunteering as a stand alone concept versus the implicit association test (IAT) which measures evaluations of opposing concepts (Greenwald et al., 2003; Karpinski & Steinman, 2006). Karpinski and Steinman have shown that measuring evaluative associations of a single concept using the SC-IAT is as effective as the traditional IAT. Following their design, the SC-IAT was built using four trial blocks, preceded by a small practice block, identified as such to explain the exercise to the participants and allow them to get used to the controls (see table 2).

*Table 2: SC-IAT Blocks (blocks in each stage were presented as continuous). * Practice Block 1 used only words as stimuli.*

Stage	Block	Trials	Function	Left 'e' Key	Right 'i' Key
Practice	1*	16	Practice	Good	Bad
A	2	24	Practice	Volunteering or Good	Bad
	3	72	Test	Volunteering or Good	Bad
B	4	24	Practice	Good	Volunteering or Bad
	5	72	Test	Good	Volunteering or Bad

The SC-IAT consisted of three stages, the first of which was a 16-trial practice stage using only words to evaluate as “good” or “bad” to familiarize the participants with the concept of the exercise. The last two stages were presented randomly to each participant and consisted of leading instructions and 24 practice trials, followed immediately by 3 blocks of 24 test trials (72 total). Each trial presented an image of volunteering or a word with either a positive (good) or negative (bad) valance in the center of the screen to evaluate according to instructions provided by stage.

In stage A (volunteering or good), instructions were given to evaluate pictures of volunteering or positive words as “good” and associated with the left side of the task screen and the ‘e’ key. Words with a negative valance were to be evaluated as bad and associated with the right-hand side of the screen and the ‘i’ key on the standard keyboard.

In stage B (volunteering or bad), instructions were given to evaluate pictures of volunteering or words with a negative valance as bad and associated with the right side of the task screen and the ‘i’ key. Positive words were to be evaluated as good and associated with the right-hand side of the screen and the ‘i’ key on the standard keyboard.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Adapting a procedure from Karpinski & Steinman (2006), volunteering images, positive words, and negative words were presented in a 10:7:7 ratio to balance images and words, resulting in 42% of trials presented with images and 58% presented with words. This had the unintended consequence of an over-weighting of correct responses (70%) on the 'e' key and left side of the screen in stage A, and the right side of the screen and "i" key in stage B.

Fourteen (14) words, selected from Affective Norms for English Words (ANEW) (Bradley & Lang, 1999) for statistically high negative and positive valence and high arousal, were used for each stage. Ten (10) target pictures were used in the object dimension, 5 were selected from the AAT volunteer set and 5 from the next highest rated volunteer images from the pre-study.

Each stage included instructions indicating how the words and photos in the object dimension were to be evaluated. Reminders indicating "Volunteering or Good" and "Bad" for Blocks A2/A3 and "Good" and "Volunteering or Bad" for Block B4/B5 were shown at the top left and right of the screen in the evaluative position.

Target words and photos were presented in the center of the screen, and remained on screen for 3000ms, with a countdown timer displayed for the last 2000ms to ensure that participants were responding more intuitively and less analytically. Between each trial there was a 100ms pause followed by a fixation cross presented for 500ms, and another 100ms pause per Greenwald et al. (2003).

Explicit Evaluations – Self reported measures

In addition to the SC-IAT, participants self-reported on feelings toward volunteering and intent to volunteer. Adapted from Van Dessel & Hughes' Experiment 3 (2017), these were intended to test hypotheses two and three and were structured as follows:

*"In general, **how** positive or negative **do you feel about volunteering?** 1 = Very negative, 4 = Neither negative nor positive, 7 = Very positive"*

*"To what extent **do you have a goal to participate in volunteering?** 1= Not at all, 7 = Very much"*

Long-Term Intent to Volunteer (LTI2V)

The previous measure of "goal to participate" is framed in the present. To test hypothesis four, an additional self-reported measure was included at the end of the Volunteer Functions Inventory questionnaire and framed as a question about volunteering in the future to overcome the present bias inherent in the previous measure.

One year from now, will you be (please select your best guess as of today):

- *volunteering at an organization I currently work with*
- *volunteering at another organization*
- *not volunteering at all*

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

This measure was re-coded as a binary dummy variable “LT Intent to Volunteer”, where option 1 or two were coded as 1 option 3 was coded as a zero.

Behavioral Click-Through Task

To test hypothesis five (H5) a behavioural task was presented as an opportunity to take a break and click a link to learn more about volunteer opportunities in the participant’s home city (as entered in demographic profile). The link opened a new tab showing an actual Google search.

Control Variables

Demographics / Traits

Frequency and time spent volunteering is influenced by age, sex, religious involvement, education, marital status, number of children, and an individual’s prosocial orientation (Finkelstein, 2008; Finkelstien, 2009; Musick & Wilson, 2007).

Age, sex, Short 5 (S5) Altruism (Konstabel et al., 2012), months unemployed, and country of residence have been captured, as control variables (along with VFI). Education and student status were included in exploratory analysis but not as control variables as these data were supplied by the recruitment platform but not included in the original experimental design.

Volunteer Functions Inventory (VFI)

The Volunteer Functions Inventory (VFI) (Chacón, Gutiérrez, Sauto, Vecina, & Pérez, 2017; Clary et al., 1998; Clary, Snyder, & Stukas, 1996; Piatak, 2016) is accepted as the standard measure of why people volunteer. It consists of 30-questions and six subscales:

- Values – allows expression of altruistic and humanitarian values
- Understanding – supports development of new knowledge
- Social – engage with friends, or in an activity that is viewed favourably by peers
- Career – developing new career skills
- Protective – from negative feelings about oneself
- Enhancement – help sustain positive affect and mood

Those that are motivated to volunteer will likely do so for some combination of the functions listed above.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

The VFI was completed by each participant and the scores for each scale calculated. Analysis includes “VFI Mean” as a proxy control variable generated from the mean of the other VFI item scores. It is moderately to strongly positively correlated with all other VFI item scores ($p < 0.0001$) (see Appendix C).

Reactance and Demand Characteristics

Participant reactance and demand characteristics were measured to test for biased responses.

5. Results

See Appendix C for detailed analysis, and Appendix G for Stata Do-files.

Preliminary Analyses

Tables 3, 4, and 5 present the means and standard deviations for demographic and explanatory variable measures for participants in the control and treatment groups. Participants in each condition did not differ on any demographic metrics or control variable scores, $p > 0.10$.

Table 3: Means and Standard Deviations () for Demographic and Control Variables

Measure	Control (n=180)	Treat (n=191)
Age	26.21 (8.03)	27.55 (9.35)
Student Status	0.47 (0.50)	0.48 (0.50)
Fluent in English	0.83 (0.37)	0.78 (0.42)
Language Count	1.13 (0.43)	1.11 (0.41)
English as First Language	0.69 (0.46)	0.72 (0.45)
Female	0.48 (0.50)	0.53 (0.50)
Education Level	1.69 (0.75)	1.77 (0.81)
Months Unemployed	15.6 (18.0)	18.5 (19.9)
S5 Altruism Score	1.22 (0.92)	1.18 (0.96)
Resisted Influence*	0.40 (0.49)	0.39 (0.49)
Respond as Exp Wanted**	0.01 (0.07)	0.01 (0.10)

* Dummy variable, encoded from Reactance responses

** Dummy variable, encoded from Demand Characteristic responses

Table 4: Tabulation of PPs, by Region and Group

Region	Control (n=180)	Treat (n=191)	Total
Asia & Oceania	4	8	12
Europe	101	118	219
North America	75	65	140
Total	180	191	371

Table 5: Means and Std. Dev. () Volunteer Functions Inventory Scores

Measure	Control (n=180)	Treat (n=191)
VFI Career	4.47 (1.29)	4.50 (1.31)
VFI Enhance	4.73 (1.19)	4.59 (1.21)

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

VFI Protect	3.93 (1.31)	3.86 (1.31)
VFI Social	3.49 (1.45)	3.31 (1.47)
VFI Understanding	5.35 (0.96)	5.20 (1.05)
VFI Values	5.44 (1.00)	5.35 (1.06)
VFI Mean*	4.57 (0.89)	4.47(0.93)

Note: PPs in the two conditions did not differ on any of the VFI scores, all $p > 0.1$

*VFI Mean is a proxy control variable generated from the Mean of other VFI scores. It is moderately to strongly positively correlated with all other VFI scores ($p < 0.001$).

Overall Effect Sizes

The means and standard deviations for all outcome measures and estimated treatment effect sizes and confidence intervals (CI) are shown in table 6. SC-IATD, EFTV, and BeCT show very small reverse treatment effects (Cohen's d , Cohen, 1988). As all CIs contain zero (the parameter value of the null hypotheses) the effect is not significant (> 0.05), and the null hypotheses cannot be rejected.

Table 6: Means and effect sizes for all outcome measures

Hyp.	Measure	Control (n=180)	Treat (n=191)		
		Mean ₁ (SD)	Mean ₂ (SD)	95% CI	dz
H1+	SC-IATD	0.15 (0.32)	0.14 (0.29)	[-0.16, 0.25]	0.045
H2+	Explicit - Intent to Volunteer (EI2V)	4.46 (1.58)	4.46 (1.61)	[-0.20, 0.20]	0.000
H3+	Explicit - Feelings of Volunteering (EFTV)	6.11 (0.96)	6.01 (1.02)	[-0.10, 0.31]	0.102
H4+	Long-Term Intent to Volunteer (LTI2V)	0.58 (0.49)	0.6 (0.49)	[-0.23, 0.18]	-0.027
H5+	Behavioural - Click through (BeCT)	0.22 (0.41)	0.14 (0.35)	[-0.01, 0.40]	0.197

Note: CI = confidence interval; SC-IATD = Single category implicit association test; dz = Cohen's d

On average, the single session of positive approach AAT Training (treatment) **did not have a statistically significant effect on any of the dependent variables** and **did not support any of the hypotheses as stated**. Results indicate a reverse effect (not significant), where the control group scores/ratings are higher than treatment. The exceptions to this are the Explicit Intent to Volunteer (EI2V), which shows no change between control and treatment, and Long-Term Intent to Volunteer (LTI2V) which shows a very small, (not significant) positive treatment effect.

Tests for Normality

Skewness and kurtosis tests were completed on non-binary dependent variables to test for normality. SC-IATD and EI2V were symmetrical, but the null hypothesis that they were not normally distributed could not be rejected. EFTV was highly skewed to the left.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Statistical Test of Null Hypotheses

Statistical tests of null hypotheses were modified to follow the form of each dependent variable. SC-IATD, EI2V, EFTV were analyzed using a two-sample ttest or Mann-Whitney, LTI2V and BeCT (binary) were analyzed using Pearson's chi2 and two-sample test of proportions.

Hypothesis 1: Implicit Evaluation of volunteering (SC-IATD)

Hypothesis 1 (H1+) asserts that positive approach AAT training toward volunteering will result in more favourable implicit evaluations of volunteering and was measured using the single category implicit association test (SC-IATD).

The average SC-IAT D score for the n=180 in the control group was $M=0.151(SD=0.323)$, compared to $M=0.137(SD=0.286)$ for the n=191 in the treatment group. The difference in means was $0.138(SE=0.0316)$, and is not statistically significant using a two-tailed test [$t(369)=0.4359, p=0.6632$] $> (p=0.05)$. We cannot reject the null hypothesis that the AAT Treatment had no effect on implicit attitudes toward volunteering, as measured by SC-IATD, and thus conclude that hypothesis 1 is not supported.

Self-Reported Measures

Hypothesis 2: Explicit Feelings Toward Volunteering (EFTV)

Hypothesis 2 (H2+) asserts that positive approach AAT training toward volunteering will result in more favourable self reported evaluations of feelings toward volunteering, and was measured with a single question, "Explicit Feelings Toward Volunteering" (EFTV).

EFTV for the n=180 in the control group was $M=6.11(SD=0.957)$, compared to $M=6.01(SD=1.02)$ for the n=191 in the treatment group. The difference in means was $0.1(SE=0.103)$, and is not statistically significant using a two-tailed test [$t(369)=0.9812, p=0.3272$] $> (p=0.05)$. Similarly, using the Mann-Whitney test, we cannot reject the null hypothesis of equality EFTV ($Prob>|z|=0.3349>0.05$) in the control and treatment groups. We cannot reject the null hypothesis that the AAT Treatment had no effect on EFTV, and thus do not have evidence to support hypothesis 2.

Hypothesis 3: Explicit Intent to Volunteer (EI2V)

Hypothesis 3 (H3+) asserts that positive approach training toward volunteering using the AAT will result in more favourable self reported goal to volunteer and was measured with a single question, "Explicit Intent to Volunteer" (EI2V).

EI2V for the n=180 in the control group was $M=4.46(SD=1.58)$, compared to $M=4.46(SD=1.61)$ for the n=191 in the treatment group. The difference in means was $0.0(SE=0.166)$, and is not statistically significant using a two-tailed test [$t(369)=0.0023, p=0.998$] $> (p=0.05)$. Similarly, using the Mann-Whitney test, we cannot reject the null hypothesis of equality between EI2V ($Prob>|z|=0.8663>0.05$) in the control and treatment groups. We cannot

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

reject the null hypothesis that the AAT Treatment had no effect on EI2V, and do not have statistically significant results to support hypothesis 3.

Hypothesis 4: Long-Term Intent to Volunteer (LTI2V)

Hypothesis 4 (H4+) asserts that positive AAT approach training toward volunteering will result in more favourable self reported long-term intent to volunteer and was measured with a single question, “Long-term Intent to Volunteer” (LTI2V).

As LTI2V is binary, it is suitable to use chi2 or two-sample test of proportions to test the treatment effect. Pearson $\chi^2=0.79>0.05$, we cannot reject the null hypothesis that the treatment had no significant effect on the LTI2V. Using the two-sample test of proportions, $Pr|Z|>|z|=0.7912>0.05$, therefore cannot reject the null hypothesis that the treatment had no effect on LTI2V, and do not have evidence to support hypothesis 4.

Hypothesis 5: Behavioural Click-Through (BeCT)

Hypothesis 4 (H4+) asserts that positive approach AAT training toward volunteering will result in an increased rate of clicking a link (behavioural task) about volunteering in participants’ home city and was measured using “Behavioural Click-through” (BeCT) rate.

As BeCT is binary, Pearson’s chi2 and two-sample test of proportions were used to test the null hypothesis. Pearson $\chi^2=Pr=0.058>0.05$ and two-sample test of proportions $Pr|Z|>|z|=0.058>0.05$. The results are not significant, and we cannot reject the null hypothesis that the treatment had no effect on BeCT rate, and hence hypothesis 5 must be rejected.

Regression Analysis

Ordinary least squares and logit regression analysis was used to evaluate the dependent measures associated with the five hypotheses, while controlling for five explanatory variables.

Pairwise correlations of dependent variables with control variables, along with experimental design

considerations were used to determine which of the control variables were to be used in regression analysis.

Table 7 shows the outcome of this analysis and includes only those control variables that have significant correlations with the dependent variables. Education level and student status were excluded from the regression analysis as they were not part of the experimental design.

Table 7: pairwise correlation between dependent variables and control variables

Control Variables	SC-IAT D	EFTV	EI2V	LTI2V	BeCT
Treatment	-0.0242	-0.0485	0.0044	0.0161	-0.0999
Female	0.0352	0.204***	0.290***	0.194***	0.0888
Age	0.140**	-0.114*	-0.0437	-0.0328	-0.0245
S5 Altruism Score	0.0842	0.355***	0.341***	0.197***	0.0413
Months Unemployed	0.0132	0.0444	-0.027	-0.0529	-0.00275
VFI Mean of Scores	0.105*	0.403***	0.530***	0.453***	0.0286
Education Level	-0.0187	-0.103*	-0.0482	0.00233	0.142**

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Student Status	-0.0064	0.0688	0.179***	0.188***	-0.0891
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* p<0.05, ** p<0.01, *** p<0.001,

Correlation Coef: 0 to 0.3: Weak, 0.3 - 0.7: Moderate, 0.7 - 1.0: Strong

From this, the following regression model was established:

$$Dep\ var = \beta_0 + \beta_1 * Treat + \beta_2 * female + \beta_3 * age + \beta_4 * altruism + \beta_5 * months\ unemployed + \beta_6 * VFI\ Mean + \varepsilon$$

Regression results (see table 8) were mixed, with the modeled explanatory variables only providing statistically significant results in 4 of the 5 dependent variables, and only three of which had explanatory value (R2) greater than 18%.

Table 8: Regression outcomes by dependent and explanatory variables

DV -->	SC-IATD		EFTV		EI2V		LTI2V		BeCT	
Regression	OLS		OLS		OLS		Logit		Logit	
R2 Pseudo R2	4%		24%		33%		18%		2%	
Prob > F Prob > chi2	0.04		0.00		0.00		0.00		0.31	
Control Variable	Coef.	P> t	Coef.	P> t	Coef.	P> t	Coef.	P> z	Coef.	P> z
Treat	-0.168	0.594	-0.059	0.518	0.074	0.589	0.200	0.411	-0.549	0.051
Female	0.001	0.965	0.142	0.134	0.439	0.002*	0.372	0.130	0.483	0.098
Age	0.005	0.004*	-0.011	0.036*	-0.003	0.680	-0.002	0.881	-0.004	0.812
Altruism	0.021	0.230	0.242	0.000*	0.273	0.00*	0.135	0.320	0.063	0.691
Months unemployed	0.000	0.917	0.003	0.155	-0.002	0.614	-0.006	0.309	0.001	0.856
VFI Mean	0.028	0.133	0.333	0.000*	0.776	0.00*	1.205	0.00*	-0.025	0.878
Cons	-0.139		4.460		0.487		-5.275		-1.417	0.092

For **SC-IATD**, only the impact of **age** ($t > 2.0, P > |t| < 0.05$) is statistically significant when controlling for the other variables. For every year older, **SC-IATD** score increases 0.005 points (~3%) on average when the other explanatory variables are kept constant. $P > |t| > 0.05$ for the other explanatory variables, indicating that there is **no significant treatment effect**, even when controlling for age, S5 altruism score, months of unemployment, and VFI Mean.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

For **EFTV**, $\text{Prob}>F=0.0<0.05$, we can reject the null hypothesis that all coefficients for explanatory variables are no better than zero. The regression model has some explanatory value. $R^2 \sim 24\%$ of the variation in **EFTV** ratings can be explained by parameters in this model. $P>|t|<0.05$ for the explanatory variables **age**, **S5 altruism score**, and **VFI Mean**, indicating that there is a significant impact on EFTV from these variables. For every year older EFTV rating decreases 0.011 points ($\sim 0.2\%$) on average. For every point higher on the **S5 altruism** scale, EFTV increases 0.24 points ($\sim 4\%$) on average. For every point higher on **VFI Mean** scores, EFTV increases 0.33 ($\sim 5.4\%$) on average.

$P>|t|>0.05$ for all other explanatory variables, including treat, being female, and months unemployed, indicating that there is not a significant impact in EFTV from these. There is **not a significant treatment effect**, even when controlling for age, S5 altruism score, months of unemployment, and VFI Mean.

For **EI2V**, $\text{Prob}>F=0.0<0.05$, we can reject the null hypothesis that all coefficients for explanatory variables are no better than zero. The regression model has some explanatory value. $R^2 \sim 33.3\%$ of the variation in EI2V ratings can be explained by parameters in this model. $t>2.0, P>|t|<0.05$ for the explanatory variables: female, S5 altruism score, and VFI Mean, indicating that there is a significant impact in EI2V from these. When controlling for these explanatory variables, being **female** increases EI2V ratings by 0.44 (10%) on average. For every point higher on the **S5 altruism** scale, EI2V increases 0.273 points ($\sim 6\%$) on average and for every point higher on **VFI Mean**, EI2V increases 0.775 ($\sim 17\%$) on average.

$t<2.0, P>|t|>0.05$ for all other explanatory variables, including treat, age, and months unemployed, indicating that there is not a significant impact on EI2V ratings from these and there is **not a significant treatment effect**, even when controlling for age, S5 altruism score, months of unemployment, and VFI Mean.

For **LTi2V**, $\text{Prob}>\chi^2=0.00<0.05$, therefore we can reject the null hypothesis that all coefficients for explanatory variables are no better than zero. The regression model has some explanatory value. Pseudo $R^2 \sim 18.1\%$ of the variation in LTi2V ratings can be explained by parameters in this model. $z>2.0, P>|z|<0.05$ for the explanatory variable **VFI Mean**, indicating that there is a statistically significant impact in LTi2V. For every point higher on **VFI Mean**, the probability that a participant has the long-term intent to volunteer increases $\sim 2\%$ on average when controlling for other explanatory variables. $[\text{Probability}=1/(1+\exp(-(1.205-5.275)))]$

$z<2.0, P>|z|>0.05$ for all other explanatory variables, including treat, female, age, S5 altruism score, and months unemployed, indicating that there is not a significant impact in LTi2V from these and there is **not a significant treatment effect**, even when controlling for age, S5 altruism score, months of unemployment, and VFI Mean.

For **BeCT**, $\text{Prob}>\chi^2=0.31>0.05$, therefore we cannot reject the null hypothesis that all coefficients for explanatory variables are no better than zero. The regression model has limited explanatory value. Pseudo $R^2 \sim 2\%$ of the variation in BeCT ratings can be explained by parameters in this model. $z<2.0, P>|z|>0.05$ for all explanatory variables, including treat, female, age, S5 altruism score, months unemployed, and VFI Mean

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

indicating that there is not a significant impact in BeCT from these and there is **not a significant treatment effect**, even when controlling for age, S5 altruism score, months of unemployment, and Mean VFI score.

6. DISCUSSION

This research set out to understand if a single session of positive approach AAT training toward volunteering would improve implicit and explicit evaluations of volunteering, increase self-reported intent to volunteer, and influences behaviours toward volunteering.

The results indicate that positive approach AAT training toward volunteering did not create a statistically

Figure 6: SC-IATD distribution for control and treatment conditions illustrate reverse effects (not sig. $p>0.05$)

significant effect across implicit, self-reported, and behavioural measures. There is evidence (e.g. figure 6) that the intervention created reverse effects and less favourable implicit and explicit evaluations of volunteering. The sections below explore possible explanations of the results and inform further research in this space.

Possible Explanation of results

There are examples in the literature of AAT training not successfully modifying the target approach bias. Kakoschke et al. (2017) found 8 of 17 studies did not have statistically significant effects. Other literature

suggest that mixed findings on the effectiveness of AAT training may point to unknown variables that are moderating the effect (Krishna & Eder, 2019; Vandenbosch & De Houwer, 2011). Regression analysis from the current study support this in that the largest significant model fit of selected explanatory variables only account for up 33% of the differences in the variation, indicating that other unknown mediating variables are likely involved.

Context Matters

The experience of being unemployed and the choice to volunteer are complex experiences influenced by individual differences and broad environmental variables. The literature illustrates that the experience of unemployment is different for every person and can vary with exogenous factors. Critics suggest that using RCEs to understand complex social problems such as these uses too narrow a frame and does not allow for understanding which interventions work best, for whom, and in what context (Bonell, Fletcher, Morton, Lorenc, & Moore, 2012). It is possible that the concepts measured in this study are too broad to be addressed with this type of intervention.

The AAT is usually applied in narrow contexts that have been found to be at the root of a larger social challenges, like manipulating approach tendencies toward unhealthy food categories to tackle obesity or training positive approach toward other races to address prejudice (Kakoschke, Hawker, Castine, de Courten, & Verdejo-Garcia, 2018; Kakoschke et al., 2017; Kawakami et al., 2007). This is not to say that these are not complex problems, but

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

more to suggest that there could be lower level constructs related to unemployment or volunteering that might be more readily manipulated with AAT training. More simply, this may have been the wrong tool for the job and this intervention is equivalent to trying to chop down a tree with a scalpel.

Experimental Limitations

Structure of the AAT

As the experimental manipulation in this RCE, the AAT structure is most likely the source of potential issues in experimental procedures.

Manipulation with the AAT was not successful: The current procedure did not include a manipulation check to verify the efficacy of the AAT manipulation. Taylor and Amir (2012), and Van Dessel, Hughes, et al.(2018) included three AAT tasks (before, manipulation, and check) to confirm that the manipulation was successful.

No repetition: AAT training has been most effective in clinical environments and evidence suggests that repeated exposure creates greater effects (Eberl et al., 2014) The discussion below on inferential accounts suggests that AAT effects are due in part to evaluative learning, which benefit from repeated exposure. However, those same accounts suggest that the AAT may not be effective if the procedure creates ambiguous associations (Van Dessel, Eder, et al., 2018), which is unlikely to improve with repetition.

Weighting of pull versus sideways trials in the control condition: As the AAT is not a standardized procedure, control conditions may vary. Kawakami et al. (2007, 2008) used a sideways only control condition moving neutral stimuli left and right, without any pulling. The current procedure used 50% weighting of sideways and pull responses balanced for each category of stimuli.

SC-IAT Design

Elements of the current SC-IAT procedure may have impacted the SC-IATD measure. Weighting of correct trial answers was unbalanced between left and right, potentially leading to response bias. IAT procedures recommend block order randomization (Greenwald et al., 2003), Karpinski & Steinman (2006) recommend against it for the SC-IAT. Procedures in this experiment randomized SC-IAT block order. Exploratory analysis (Appendix H) identified distinct slope differences in response times versus block order that could have impacted SC-IATD scores and should be investigated further.

Missing Explanatory Variables

The literature on both unemployment and volunteering include a much broader set of variables than those captured and analyzed in this experiment, including critical demographic correlates to volunteering activity and state measures that predict poor coping with unemployment (Payne, Warr, & Hartley, 1984; Warr, Jackson, & Banks, 1988). This additional information may have provided better clarity as explanatory variables in regression analysis.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Alternate Mechanisms – Altered Procedures

The dominant explanation of AAT effectiveness follows the *motivational-systems* account, which suggests that AAT training creates mental associations between the images on screen and evolutionary centers in the brain that regulate distances when approaching and avoiding stimuli (Van Dessel, Eder, et al., 2018).

Two recent investigations highlight other mechanisms for AAT training effectiveness. The *inferential account* suggests that individuals evaluate stimuli based on learned inferences from previous actions (Van Dessel, Eder, et al., 2018). When something is repeatedly approached or avoided, it is likely that future implicit and explicit evaluations of that stimuli will follow previous learning. The *common-coding account* suggests that all perceptions and actions are represented in the brain by a network of distributed codes, called “event files”, which contain information about whether an event was positive or negative (Van Dessel, Eder, et al., 2018). In this account, approach or avoidance events should also encode an “affective code” representing a positive or negative emotional valence to target stimuli. This account suggests that AAT training establishes or modifies emotional valence associations to presented stimuli. These codes can be established based on several broad cues, including verbal descriptors of movement goals and framing of an action in positive terms.

In considering implications of these alternate mechanisms, minor adjustments to experimental procedures could be made, possibly resulting in a more effective intervention.

Disambiguating Action Valance and Instructional Language

The current study did not incorporate learnings from *inferential* and *common coding* accounts of AAT effectiveness. Instructions were clearly explained but did not serve to disambiguate valence of actions in relation to procedural stimuli. Further, instructions used “toward” framing instead of approach.

In *inferential* and *common coding* accounts, words used in instructions can support establishing valence. “Approach-avoidance” frames were found to be more valenced than “up-down” or “toward-away” frames, and experiments using approach and avoid frames were shown to have larger average effects (Van Dessel, De Houwer, Gast, & Smith, 2015; Van Dessel, Eder, et al., 2018). This framing made it possible for participants to infer or code those valences to actions and related stimuli.

Alternate procedures could make it more salient that the intent is to APPROACH images of volunteering and all other images are to be moved to the side. There is some risk that this engages analytical thought processes, potentially diminishing implicit evaluations of the stimuli. However, it does make the exercise less ambiguous, and establishes a positive association with volunteer stimuli per evaluative learning processes.

Procedures to select volunteer images used explicit categorization and ranking but did not establish valence and arousal qualities associated with these images. Having more salient framing of action intent could contribute to establishing a positive valence association with volunteer stimuli (Van Dessel et al., 2015).

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

This is further supported by Van Dessel, Eder, et al. (2018) that suggests the approach and avoidance movement common in the AAT provides limited inferential cues when it is not relevant to the training task. Current instructions to pull green framed images and move tan framed images sideways did not create salient cues that volunteering should be evaluated positively.

Future Recommendations

If AAT training is to be applied in the target domains, it would be valuable to gather further evidence in the areas discussed below.

Validation of AAT beta

The beta AAT task in Gorilla™ should be validated by replicating existing keyboard driven AAT experiments and looking at comparable results to ensure there are not exogenous factors from the platform that are interfering with results.

Isolate contexts for AAT training – Volunteering or Unemployment

There is value in repeating this experiment with a representative sample of a general population to validate manipulating approach toward volunteering excluding unemployment. Alternately, replicating an existing study like Cheval et al (2016) that retrained approach behaviours toward exercise with an unemployed population may remove complexities of volunteering.

Further Validation of Volunteer Stimuli

Images of volunteering should be further validated to measure arousal and valance.

Country Focus

Online recruitment and experimental platforms are providing better access to populations. It is recommended that future experiments are limited to a single country.

Procedural changes

Small procedural changes derived from the literature and discussion are recommended when using online recruitment and experimental platforms.

- Capture **additional data**:
 - Demographic: Race, marital status, religious affiliation, number of children, socioeconomic status (SES), volunteer activity, student status
 - State: psychological distress, anxiety, depression, and self-esteem
 - Trait: self-efficacy

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

- **Data Quality:** Add questions and tasks to identify careless responders. Consider a self-declaration by participants to indicate that researchers should exclude their data (see: Buchanan & Scofield, 2018; Curran, 2016; Meade & Craig, 2012)
- **AAT manipulation check:** the current procedure did not verify AAT training manipulation was effective. This should be included in future experiments prior to any dependent measures.
- **Alternate or additional control conditions:**
 - **Sideways:** A sideways only AAT control may have provided different insights into possible effects.
 - **Avoidance:** The current AAT procedure used an approach-sideways structure as volunteering does not have an opposing concept. Given that the unemployed often spend time on unproductive leisure activities, there could be an opportunity to add activities like watching tv and playing video games in the avoidance frame (see: Cheval et al., 2016).

Further Analysis of Existing Data

There are opportunities to look at the existing data. Exploratory sub-group analysis (Appendix H) indicated that age groupings and country of residence had opposing effects on implicit and explicit measures. This could be investigated further to inform future research in this area.

Analysis of response times as a function of SC-IAT block randomization order should also be investigated. IAT procedures recommend block order randomization (Greenwald et al., 2003), Karpinski & Steinman (2006) recommend against it for the SC-IAT. This experiment randomized block order and exploratory analysis (Appendix H) found distinct slope differences in response times versus block order that should be investigated further.

General Study Limitations

Study Controls

This study was conducted online, which carries important limitations about exogenous factors that may have influenced individuals while participating in this study. Attempts to manage variability in response quality and task focus have been made through listing pre-requisites and completing quality checks, like device compatibility. It is impossible to control for other environmental factors that may have influenced experimental outcomes.

External Validity

There are important limitations of this study as it relates to external validity and generalizability of these results. As this experiment was completed online, results may not be generalizable in other contexts, including other online contexts. Recruitment specifically targeted English-speaking unemployed job seekers in select countries

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

and findings cannot be applied outside of this specific population. This study was designed to manipulate approach biases toward volunteering in unemployed job seekers. Further research is required to understand and clarify these results before considering them in professional or clinical applications.

Conclusion

One could argue that interventions that influence automatic associations are paternalistic. Although influenced, participants are free to take actions that are deemed beneficial, as judged by themselves. Sunstein (2019) asserts that we have a duty to support members of society that have difficulty navigating unfortunate circumstances in which they may find themselves. The unemployed face potential isolation, reduced agency, and drastic impacts to their mental and physical wellbeing. We therefore have a responsibility to investigate all opportunities to support the unemployed to stay engaged in society while on their path to re-employment.

This study was predicated on a belief that simple behavioural interventions can support unemployed job seekers to engage in beneficial activities, help maintain their wellbeing, and ultimately lead to re-employment. In short, the intent was to investigate if a single session of volunteering focused, positive-approach AAT training would increase implicit evaluations, explicit self-reported measures, and behaviours toward volunteerism by unemployed jobseekers.

Outcomes of this study include an AAT task that is now in beta on Gorilla™ and available for current and future behavioural scientists to use for their own research. The experiment, tasks, questionnaires, and validated “volunteering” stimuli have been made available on Gorilla™ Open Materials for re-use.

Important individual insights were gained from this exercise, including an appreciation for the complexity unemployment and the broad concept of volunteering. When an intervention is successful, it is not always important to understand the mechanism (Halpern, 2016). Understanding why an intervention fails to show significant results is the fuel that drives further investigation. Important insights were gained in looking at alternate accounts of why AAT training is effective and might explain why these results did not support the hypotheses being investigated.

Although the findings did not support the hypotheses and procedures as designed did not show a significant positive treatment effect, they are not without value. Exploratory analysis indicates avenues for further investigation procedural improvements for future studies.

In conclusion, the current research contributes to the literature in extending the application of AAT training into the vocational and volunteering domains. Practically speaking, this study looks at ways to apply AAT training as an intervention to the very real problems faced by the unemployed as they look for opportunities to re-establish the secondary benefits they once enjoyed through employment. In the future, further empirical evidence is required to fully understand how AAT training could be applied in this domain, and it is my hope that this

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

research and recommendations for future opportunities encourage others to investigate the potential of AAT training in these domains.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

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Appendix A: AUJSTV Experimental Design & Procedures

The complete experimental structure, including complete tasks, questionnaires, scripting, and manipulation spreadsheets have been shared with the behavioural science community through Gorilla™ Open Materials:

<https://gorilla.sc/openmaterials/50453>

Short-Five (S5) Altruism Scale

Reference: (Konstabel, Lönnqvist, Walkowitz, Konstabel, & Verkasalo, 2012)

Preview on Gorilla™ Open Materials: <https://gorilla.sc/openmaterials/50453>

Short Survey – Instructions

Please **read the following statements carefully** and indicate to what extent they apply to you. Select the suitable number in the boxes after each descriptive statement.

Use the following scale:

- -3 = Completely Wrong
- -2 = Mostly Wrong
- -1 = More wrong than right
- 0 = Neutral; neither right nor wrong
- 1 = More right than wrong
- 2 = Mostly Right
- 3 = Completely Right

In some cases, you may want to give different answers to different parts of an item. In these case try to find an "average answer" giving more weight to the part(s) that you consider more important.

For example, if you think the start of an item is "mostly right" about you but the end is "more wrong than right" then pick one of the options between them (0 or 1 or example).

Reference: Konstabel, K., Lönnqvist, J. E., Walkowitz, G., Konstabel, K., & Verkasalo, M. (2012). The "Short Five" (S5): Measuring personality traits using comprehensive single items. European Journal of Personality, 26(1), 13–29. <https://doi.org/10.1002/per.813>

I am caring and attentive when it comes to other people.

Wrong

-3	-2	-1	0	1	2	3
----	----	----	---	---	---	---

Right

When someone needs assistance, I discontinue my activities to help

I do not want to deal with other people's problems

I am considered a selfish and egotistical person

Short-Five (S5) Scoring and variable coding script for Gorilla™ adapted from: (Gorilla Support, 2019)

```
var altruism1Normal = parseInt(gorilla.retrieve('altruism1Normal', 0, true));  
var altruism2Normal = parseInt(gorilla.retrieve('altruism2Normal', 0, true));
```


ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
var altruism3Reverse = 0 - parseInt(gorilla.retrieve('altruism3Reverse', 0, true));
var altruism4Reverse = 0 - parseInt(gorilla.retrieve('altruism4Reverse', 0, true));
var altruism = (altruism1Normal + altruism2Normal + altruism3Reverse + altruism4Reverse) / 4;
var altruismRange = [-0.326, 0.44, 2.542];
var getRating = function(score, range) {
    if(score < range[0]) {
        return 'Low';
    } else if(score >= range[0] && score < range[1]) {
        return 'Medium Low';
    } else if(score >= range[1] && score < range[2]) {
        return 'Medium High';
    } else {
        return 'High';
    }
}
var altruismRating = getRating(altruism, altruismRange);
gorilla.store('altruism_score', altruism, true);
gorilla.store('altruism_rating', altruismRating, true);
gorilla.metric({
    question_key: 'altruism_score',
    response: altruism,
})
gorilla.metric({
    question_key: 'altruism_rating',
    response: altruismRating,
})
```

Approach-Avoidance Task (AAT) Training Procedure

References: (Kawakami, Phills, Steele, & Dovidio, 2007; Kawakami, Steele, Cifa, Phills, & Dovidio, 2008)

Preview on Gorilla™ Open Materials: <https://gorilla.sc/openmaterials/50453>

Single Category Implicit Association Test (SC-IAT) Procedure

Reference: (Greenwald, Nosek, & Banaji, 2003; Karpinski & Steinman, 2006)

Preview on Gorilla™ Open Materials: <https://gorilla.sc/openmaterials/50453>

Explicit Measures

Adapted from Van Dessel & Hughes Experiment 3 (2017)

Preview as part of full experiment on Gorilla™ Open Materials: <https://gorilla.sc/openmaterials/50453>

Intended to capture self-reported evaluations as: feelings toward volunteering (EFTV) , intention to volunteer (EI2v), and intention to volunteer a year in the future (LTI2V). The last measure was presented at the bottom of the Volunteer Functions Inventory (VFI) shown in the section following this.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

In general, how positive or negative do you feel about volunteering?
1 = Very negative, 4 = Neither negative nor positive, 7 = Very positive

Very negative	1	2	3	4	5	6	7	Very positive
---------------	---	---	---	---	---	---	---	---------------

To what extent do you have a goal to participate in volunteering?
1 = Not at all, 7 = Very much

Not at all	1	2	3	4	5	6	7	Very much
------------	---	---	---	---	---	---	---	-----------

Next

One year from now, will you be (please select your best guess as of today):

- ☐ volunteering at an organization I currently work with
- ☐ volunteering at another organization
- ☐ not volunteering at all.

Behavioural Click-Through Task (BeCT), to test H5+

Loosely adapted from Van Dessel & Hughes Experiment 3 (2017)

Preview on Gorilla™ Open Materials: <https://gorilla.sc/openmaterials/50453>

The Behavioural Click-Through (BeCT) task is structured as an opportunity to click on a link and learn about volunteering in the participant's home city (as entered in demographic profile). The task, presented as an opportunity to take a break between questionnaires, invited participants to learn more about volunteering. The link was scripted to open a new tab showing an actual Google Search for volunteering in their home city. *The figures below* show an example where a *fictitious* participant from Vancouver, Canada is invited to learn more about volunteering in that city.

This was intended to test responses in the treatment and control group to measure differences resulting from the experimental manipulation. It was encoded as a 1 or 0, with 1 =click-through.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Volunteer Functions Inventory (VFI) and Self-Reported Long-Term Intent to Volunteer (LTI2V).

References: (Chacón, Gutiérrez, Sauto, Vecina, & Pérez, 2017; Clary, Snyder, & Stukas, 1996)

Preview on Gorilla™ Open Materials: <https://gorilla.sc/openmaterials/50453>

Volunteering

Please answer these questions in relation to an organization or cause that you are currently or considering volunteering with.

If you are not actively volunteering or considering volunteering at this time, please think about an organization or cause that you admire and might consider volunteering for in the future when answering these questions.

Please indicate how important or accurate each statement is for you when considering volunteer work. (1 = not at all important/accurate; 7 = extremely important/accurate.

1. Volunteering can help me get my foot in the door at a place where I'd like to work

1	2	3	4	5	6	7
---	---	---	---	---	---	---

2. My friends volunteer.
3. I am concerned about those less fortunate than myself.
4. People I'm close to want me to volunteer.
5. Volunteering makes me feel important
6. People I know share an interest in community service.
7. No matter how bad I've been feeling, volunteering helps me to forget about it.
8. I am genuinely concerned about the particular group I am serving.
9. By volunteering, I feel less lonely.
10. I can make new contacts that might help my business career.
11. Doing volunteer work relieves me of some of the guilt over being more fortunate than others.
12. I can learn more about the cause for which I am working.
13. Volunteering increases my self-esteem.
14. Volunteering allows me to gain a new perspective on things.
15. Volunteering allows me to explore different career options.
16. I feel compassion toward people in need.
17. Others with whom I am close place a high value on community service.
18. Volunteering lets me learn through direct "hands on" experience.
19. I feel it is important to help others.
20. Volunteering helps me work through my own personal problems.
21. Volunteering will help me succeed in my chosen profession.
22. I can do something for a cause that is important to me.
23. Volunteering is an important activity to the people I know best.
24. Volunteering is a good escape from my own troubles.
25. I can learn how to deal with a variety of people.
26. Volunteering makes me feel needed.
27. Volunteering makes me feel better about myself.
28. Volunteering experience will look good on my resume.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

29. Volunteering is a way to make new friends.
30. I can explore my own strengths.

One year from now, will you be (please select your best guess as of today):

- ☒ volunteering at an organization I currently work with
☐ volunteering at another organization
☐ not volunteering at all.

References:

Clary, E. G., Snyder, M., Ridge, R. D., Copeland, J., Stukas, A. A., Haugen, J., & Miene, P. (1998). Understanding and assessing the motivations of volunteers: a functional approach. *Journal of Personality and Social Psychology*, 74(6), 1516.

Chacón, F., Gutiérrez, G., Sauto, V., Vecina, M. L., & Pérez, A. (2017). Volunteer Functions Inventory: A systematic review. *Psicothema*, 29(3), 306–316. <https://doi.org/10.7334/psicothema2016.371>

Volunteer Functions Inventory (VFI) scoring and variable coding script for Gorilla™ adapted from: (Gorilla Support, 2019)

```
var VFI01 = parseInt(gorilla.retrieve('VFI01', 4, true));  
var VFI02 = parseInt(gorilla.retrieve('VFI02', 4, true));  
var VFI03 = parseInt(gorilla.retrieve('VFI03', 4, true));  
var VFI04 = parseInt(gorilla.retrieve('VFI04', 4, true));  
var VFI05 = parseInt(gorilla.retrieve('VFI05', 4, true));  
var VFI06 = parseInt(gorilla.retrieve('VFI06', 4, true));  
var VFI07 = parseInt(gorilla.retrieve('VFI07', 4, true));  
var VFI08 = parseInt(gorilla.retrieve('VFI08', 4, true));  
var VFI09 = parseInt(gorilla.retrieve('VFI09', 4, true));  
var VFI10 = parseInt(gorilla.retrieve('VFI10', 4, true));  
var VFI11 = parseInt(gorilla.retrieve('VFI11', 4, true));  
var VFI12 = parseInt(gorilla.retrieve('VFI12', 4, true));  
var VFI13 = parseInt(gorilla.retrieve('VFI13', 4, true));  
var VFI14 = parseInt(gorilla.retrieve('VFI14', 4, true));  
var VFI15 = parseInt(gorilla.retrieve('VFI15', 4, true));  
var VFI16 = parseInt(gorilla.retrieve('VFI16', 4, true));  
var VFI17 = parseInt(gorilla.retrieve('VFI17', 4, true));  
var VFI18 = parseInt(gorilla.retrieve('VFI18', 4, true));  
var VFI19 = parseInt(gorilla.retrieve('VFI19', 4, true));  
var VFI20 = parseInt(gorilla.retrieve('VFI20', 4, true));  
var VFI21 = parseInt(gorilla.retrieve('VFI21', 4, true));  
var VFI22 = parseInt(gorilla.retrieve('VFI22', 4, true));  
var VFI23 = parseInt(gorilla.retrieve('VFI23', 4, true));  
var VFI24 = parseInt(gorilla.retrieve('VFI24', 4, true));  
var VFI25 = parseInt(gorilla.retrieve('VFI25', 4, true));  
var VFI26 = parseInt(gorilla.retrieve('VFI26', 4, true));  
var VFI27 = parseInt(gorilla.retrieve('VFI27', 4, true));  
var VFI28 = parseInt(gorilla.retrieve('VFI28', 4, true));  
var VFI29 = parseInt(gorilla.retrieve('VFI29', 4, true));  
var VFI30 = parseInt(gorilla.retrieve('VFI30', 4, true));
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
var VFICareer = (VFI01 + VFI10 + VFI15 + VFI21 + VFI28)/5;
var VFISocial = (VFI02 + VFI04 + VFI06 + VFI17 + VFI23)/5;
var VFIVValues = (VFI03 + VFI08 + VFI16 + VFI19 + VFI22)/5;
var VFIUnderstd = (VFI12 + VFI14 + VFI18 + VFI25 + VFI30)/5;
var VFIEnhance = (VFI05 + VFI13 + VFI26 + VFI27 + VFI29)/5;
var VFIProtect = (VFI07 + VFI09 + VFI11 + VFI20 + VFI24)/5;

// See Chacon et. al for Mean and SD by Scale
// Chacón, F., Gutiérrez, G., Sauto, V., Vecina, M. L., & Pérez, A. (2017).
// Volunteer Functions Inventory: A systematic review. Psicothema, 29(3),
// 306–316. https://doi.org/10.7334/psicothema2016.371

var VFICareerRange = [1.66, 2.89, 4.12];
var VFISocialRange = [2.08, 3.61, 5.14];
var VFIVValuesRange = [3.86, 5.21, 6.56];
var VFIUnderstdRange = [2.77, 4.26, 5.75];
var VFIEnhanceRange = [2.59, 4.22, 5.85];
var VFIProtectRange = [1.36, 2.82, 4.28];

var getRating = function(score, range) {
  if(score < range[0]) {
    return 'Low';
  } else if(score >= range[0] && score < range[1]) {
    return 'Medium Low';
  } else if(score >= range[1] && score < range[2]) {
    return 'Medium High';
  } else {
    return 'High';
  }
}

var VFICareerRating = getRating(VFICareer, VFICareerRange);
var VFISocialRating = getRating(VFISocial, VFISocialRange);
var VFIVValuesRating = getRating(VFIVValues, VFIVValuesRange);
var VFIUnderstdRating = getRating(VFIUnderstd, VFIUnderstdRange);
var VFIEnhanceRating = getRating(VFIEnhance, VFIEnhanceRange);
var VFIProtectRating = getRating(VFIProtect, VFIProtectRange);

gorilla.store('VFICareer_score', VFICareer, true);
gorilla.store('VFICareer_rating', VFICareerRating, true);

gorilla.store('VFISocial_score', VFISocial, true);
gorilla.store('VFISocial_rating', VFISocialRating, true);

gorilla.store('VFIVValues_score', VFIVValues, true);
gorilla.store('VFIVValues_rating', VFIVValuesRating, true);

gorilla.store('VFIUnderstd_score', VFIUnderstd, true);
gorilla.store('VFIUnderstd_rating', VFIUnderstdRating, true);

gorilla.store('VFIEnhance_score', VFIEnhance, true);
gorilla.store('VFIEnhance_rating', VFIEnhanceRating, true);
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
gorilla.store('VFIProtect_score', VFIProtect, true);
gorilla.store('VFIProtect_rating', VFIProtectRating, true);
```

```
gorilla.metric({
  question_key: 'VFI_Career_score',
  response: VFICareer,
})
```

```
gorilla.metric({
  question_key: 'VFI_Career_rating',
  response: VFICareerRating,
})
```

```
gorilla.metric({
  question_key: 'VFI_Social_score',
  response: VFISocial,
})
```

```
gorilla.metric({
  question_key: 'VFI_Social_rating',
  response: VFISocialRating,
})
```

```
gorilla.metric({
  question_key: 'VFI_Values_score',
  response: VFIValues,
})
```

```
gorilla.metric({
  question_key: 'VFI_Values_rating',
  response: VFIValuesRating,
})
```

```
gorilla.metric({
  question_key: 'VFI_Understd_score',
  response: VFIUnderstd,
})
```

```
gorilla.metric({
  question_key: 'VFI_Understd_rating',
  response: VFIUnderstdRating,
})
```

```
gorilla.metric({
  question_key: 'VFI_Enhance_score',
  response: VFIEnhance,
})
```

```
gorilla.metric({
  question_key: 'VFI_Enhance_rating',
  response: VFIEnhanceRating,
})
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
gorilla.metric({
  question_key: 'VFIProtect_score',
  response: VFIProtect,
})

gorilla.metric({
  question_key: 'VFIProtect_rating',
  response: VFIProtectRating,
})
```

Demand Characteristics and Reactance

Adapted from: (Van Dessel & Hughes, 2017)

Preview on Gorilla Open Materials: <https://gorilla.sc/openmaterials/50453>

Earlier we asked you to indicate how positively or negatively you felt about volunteering. On what basis did you give those ratings?

I responded based on:

- ☐ how I thought the experimenter wanted me to respond
- ☐ my own perception of volunteering
- ☐ I do not know why I chose the ratings I gave

Do you think that the experiment tried to influence how you felt about volunteering? If so, to what extent did you resist our attempts to influence how you felt?

- ☐ I do not think the experiment tried to influence my feelings
- ☐ I did not resist attempts to influence how I felt at all
- ☐ I slightly resisted attempts to influence how I felt
- ☐ I very strongly resisted attempts to influence how I felt

These were further encoded to variables:

- `exper_wanted`, where if option 1 was selected for the first question above, it was encoded as =1, else 0.
- `Resist`: where if options 3 or 4 were selected for the first question above, it was encoded as =1, else 0.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Debrief & Opt-Out

Reference: (Rinck & Becker, 2007)

Preview on Gorilla Open Materials: <https://gorilla.sc/openmaterials/50453>

Thank-you for Participating

Important Debrief and Feedback

We appreciate your participation in our study and thank you for spending the time helping us with our research!

In this study, you were shown pictures on the screen and may have been asked to press the down arrow key, which had the visual effect of making the picture larger and the appearance that the picture was moving toward yourself. Alternately you may have been asked to move pictures off the screen to the left or right.

This is a modified version of a procedure called **the "Approach Avoidance Task"** (Rinck & Becker, 2007) which **may encourage a more positive attitude toward the subject matter of pictures that appeared to move toward yourself**. In this case, the subject matter was volunteering.

The purpose of this study was to measure differences in attitudes toward volunteering between individuals that have participated in the AAT procedure above and those who have not. It is expected that overall, the average responses of the entire group of individuals that participated in the procedure above will have a more positive attitude toward volunteering than those that did not.

All information you provided is considered completely confidential; your name will not be included or in any other way associated, with the data collected in the study. Furthermore, because the interest of this study is in the average responses of the entire group of participants, you will not be identified individually in any way in any written reports of this research. All identifying information will be removed from the data prior to download from the experimental platform.

If you do not wish your data to be used for this purpose, you may select the *Opt-Out* box at the bottom of this screen.

We hope that this has been an interesting experience for you and appreciate your participation.

I wish to completely Opt-Out of this study

☐ Opt-Out

Appendix B: Data Exclusion Procedures

As experimental controls were not in place to flag careless responders, additional procedures were required to exclude data based on data quality. 33 participants were excluded, as shown in the table below. These procedures were completed in Microsoft® Office Excel, and Stata®. Appendix G: section 2 includes Stata Do-files for Data Quality Checks.

Measure	Group		Total	Notes
	Control	Treat		
SC-IAT ERROR	2	0	2	
SC-IAT < 350ms	12	11	23	Greater than 10%
AAT Error	0	1	1	one already removed due to SC-IAT error
Three-Hurdle	4	3	7	Duration measures were superseded by other categories. Three hurdle tests: - VFI Max Long-String - VFI Person-Corr-Items - VFI Person-Corr by Subscale - VFI inter-item SD >P99
Total	18	15	33	

Data Exclusion Procedures

1. **SC-IAT error rate** - greater than 20%
2. **SC-IAT fast response** - more than 10% of responses faster than 350ms (Greenwald, Nosek, & Banaji, 2003; Karpinski & Steinman, 2006)
3. **AAT error rate / unsanctioned responses** (see: Kawakami et al., 2007, 2008; Krishna & Eder, 2018; Woud, Maas, Becker, & Rinck, 2013)
4. **Three-hurdle quality-check**, exclusion occurred if three of the following criteria were met:
 - a. fast **duration** across several experimental tasks (unused);
 - b. **maximum long string** (see Excel macro from: Landers, 2016)
 - c. **Mahalanobis distance** (on VFI);
 - d. **person correlation by item & subscale** (on VFI)
 - e. **inter-item standard deviation** (on VFI)

Careless responder protocols per (Buchanan & Scofield, 2018; Curran, 2016; Kantor, 2006; Marjanovic, Holden, Struthers, Cribbie, & Greenglass, 2015; Meade & Craig, 2012; Steedle, 2018).

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Appendix C: Statistical Analysis

Dependent Variable correlations to Control Variables

- SC-IATD – Single Category Implicit Association Test D score
- EFTV – Explicit Feelings Toward Volunteering
- EI2V – Explicit Intent to Volunteer
- LTI2V – Long-term Intent to Volunteer
- BeCT – Behavioural Click-Through
- VFI Mean – Mean of other VFI item scores

Control Variables	SC-IAT D	EFTV	EI2V	LTI2V	BeCT
Treatment	-0.0242	-0.0485	0.0044	0.0161	-0.0999
Female	0.0352	0.204***	0.290***	0.194***	0.0888
Age	0.140**	-0.114*	-0.0437	-0.0328	-0.0245
S5 Altruism Score	0.0842	0.355***	0.341***	0.197***	0.0413
Months Unemployed	0.0132	0.0444	-0.027	-0.0529	-0.00275
VFI Mean	0.105*	0.403***	0.530***	0.453***	0.0286
Education Level	-0.0187	-0.103*	-0.0482	0.00233	0.142**
Student Status	-0.0064	0.0688	0.179***	0.188***	-0.0891

* p<0.05, ** p<0.01, *** p<0.001

Correlation Coeff: 0 to 0.3: Weak, 0.3 - 0.7: Moderate, 0.7 - 1.0: Strong

Statistically Significant Correlations

- SC IATD:
 - Weak positive correlation with Age and VFI Mean
- EFTV
 - Weak positive correlation to EFTV and being a female
 - Weak negative correlation between age and EFTV
 - Moderate positive correlation between EFTV and S5Altruism Score and EFTV and VFI Mean of VFI Scores.
- EI2V
 - Weak positive correlation between EI2V and being a female, EI2V and being a student (interaction between female and student?);
 - Moderate positive correlation between EI2V and S5 Altruism Score Mean, and EI2V and of VFI Scores
- LTI2V
 - Weak positive correlation between EI2V and being a female, EI2V and being a student (interaction between female and student?) and EI2V and S5 Altruism Score
 - Moderate positive correlation between EI2V and Mean of VFI Scores
- BCT
 - Weak positive correlation between EI2V and Education level

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Correlation – Volunteer Functions Inventory Items and VFI Mean

This section shows the correlations between Volunteer Functions Inventory items and VFI Mean.

Stata Commands

```
gen vfi_mean = (vfi_career_sc + vfi_enhance_sc + vfi_protect_sc + vfi_social_sc + vfi_understd_sc + vfi_values_sc)/6
```

```
pwcorr vfi_career_sc vfi_enhance_sc vfi_protect_sc vfi_social_sc vfi_understd_sc vfi_values_sc vfi_mean,
print(0.05) star(0.0001) Bonferroni
```

Output

VFI Item	Career	Enhance	Protect	Social	Understanding	Values
Career						
Enhance	0.5142*					
Protect	0.3971*	0.7382*				
Social	0.3519*	0.4118*	0.4587*			
Understanding	0.5561*	0.6778*	0.5612*	0.3587*		
Values	0.2291*	0.4816*	0.4637*	0.3797*	0.6189*	
VFI Mean	0.6839*	0.8430*	0.8082*	0.6878*	0.8109*	0.6744*

Correlation Coefficients: 0 to 0.3: Weak, 0.3 - 0.7: Moderate, 0.7 - 1.0: Strong

VFI is moderately to strongly positively correlated ($p < 0.0001$) with all VFI Item scales, hence can be used in regression analysis as a proxy for the other items.

Detailed Statistical Analysis – Dependent Variables

Detailed statistical analyses of dependent variables have been uploaded to Open Science Framework:

https://osf.io/6zvq3/?view_only=5da9f06186ce4e65ad360d87a193ef42

Reactance and Demand Characteristics

Resist =1 if slightly or strongly resisted (n=147)

```
. tab resist reactance_q
```

Did you Resist Influence	Q-GOR Reactance				Total
	I do not	I did not	I slightl	I very st	
Did_not_resist	133	91	0	0	224
Resisted_influence	0	0	99	48	147
Total	133	91	99	48	371

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
. tab resist treat
```

Did you Resist Influence	Q-GOR Control or Treatment		Total
	Control	Treat	
Did_not_resist	108	116	224
Resisted_influence	72	75	147
Total	180	191	371

The table above shows that the distribution of participants that resisted were evenly distributed between Treatment and Control. There was no statistical influence of resisting on the result.

Exper_wanted = 1 if responded "How I thought the experimenter wanted me to" (n=3)

```
. tab exper_wanted dem_char_q
```

exper_wanted	Q-GOR Demand Characteristics			Total
	how I tho	my own pe	I do not	
0	0	366	2	368
1	3	0	0	3
Total	3	366	2	371

There were very few participants that responded "as the experimenter wanted".

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Appendix D: Post-Hoc Power Analysis

Duplicate of Table 6: Means and effect sizes for all outcome measures

	Control (n=180)	Treat (n=191)		
Measure	Mean ₁ (SD)	Mean ₂ (SD)	95% CI	dz
SC-IATD	0.15 (0.32)	0.14 (0.29)	[-0.16, 0.25]	0.045
Explicit - Intent to Volunteer (EI2V)	4.46 (1.58)	4.46 (1.61)	[-0.20, 0.20]	0.000
Explicit - Feelings of Volunteering (EFTV)	6.11 (0.96)	6.01 (1.02)	[-0.10, 0.31]	0.102
Behavioural - Click through (BeCT)	0.22 (0.41)	0.14 (0.35)	[-0.01, 0.40]	0.197
Long-Term Intent to Volunteer (LTI2V)	0.58 (0.49)	0.6 (0.49)	[-0.23, 0.18]	-0.027

Note: CI = confidence interval; SC-IATD = Single category implicit association test; dz = Cohen's d

Post-hoc power Analysis was completed using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007). Two-tailed t-tests. BeCT and LTI2V were computed using Difference between two independent proportions. All indicate that the experiment was under-powered for these small effect sizes when looking at average effects across a broad population of English-speaking job-seeking unemployed.

Appendix E: Specifications for Approach Avoidance Task Module in GORILLA™

Keyboard Based AAT Specification Document

The text below is a verbatim copy of the specification document, as provided to support@GORILLA.sc on July 24, 2019.

Keyboard Approach Avoidance Task

Image Scaling

The Rick & Becker study below represents a reasonable standard for managing the “zoom effect” of the image stimuli. This study uses the joystick (using the keyboard will be addressed in the next section) and uses 7 picture sizes to manage the zoom-in and zoom-out effect tied to the joystick position.

I expect it would be easier for GORILLA™ to scale images up and down using Javascript versus needing the experimenter to manage an upload all sizes of all pictures.

Note that the referenced study was designed in 2007 with a screen resolution of 1024x768. Current desktop resolutions are much higher (see [US and UK Desktop Screen Resolution 2018-2019 added below](#)), and scaling should be done on a relative % basis to match those shown below.

The table below provides calculated image size % of screen resolution for reference (see Excel spreadsheet and PDF file that accompanies this document).

Original Screen Resolution	1024	768							New Screen Resolution	
									1920	1080
	Original Sizes				% of Screen		% of Med Size		Derived Image Size	
Image	W	H	Joystick Angle (DEG)	Arrow Key	W	H	W	H	W	H
Medium Size	400	300	0	0	39.06%	39.06%	100%	100%	750	422
Pull #1	480	360	-7	1 Down	46.88%	46.88%	120%	120%	900	506
Pull #2	560	420	-15	2 Down	54.69%	54.69%	140%	140%	1050	591
Pull #3	680	510	-22	3 Down	66.41%	66.41%	170%	170%	1275	717
Pull #4 (Image Dissappears)	0	0	-30	4 Down	0.00%	0.00%	0%	0%	0	0
Push #1	300	225	-7	1 Up	29.30%	29.30%	75%	75%	563	316
Push #2	220	165	-15	2 Up	21.48%	21.48%	55%	55%	413	232
Push #3	132	99	-22	3 Up	12.89%	12.89%	33%	33%	248	139
Push #4 (Image Dissappears)	0	0	-30	4 Up	0.00%	0.00%	0%	0%	0	0

Rinck & Becker (2007):

https://www.academia.edu/13987616/Approach_and_avoidance_in_fear_of_spiders

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

All pictures were presented on a computer screen with a resolution of 1024x768 pixels.

Each trial was initiated by the participant: as soon as the joystick was positioned in the central “rest position” and the participant pressed the “start” button located near the top of the joystick, a picture appeared. The participant then had to decide whether the picture contained a spider or not and then pull or push the joystick accordingly. The difference between the two types of pictures was easily visible. The picture disappeared as soon as the joystick was moved by approx.. 30 DEG, either towards the participant or away from him or her. This was close to the maximum possible movement that the joystick allowed (approx.. 32 DEG).

The picture disappeared irrespective of whether the joystick was moved in the correct or wrong direction. Joystick motions to the left or right did not cause the pictures to disappear. The time from appearance of the picture to its disappearance was automatically recorded by the computer. The next picture appeared after moving the joystick back into the central position and pressing the start button.

To allow for the intended zooming effect, seven different sizes of each picture were created. The size presented on the screen depended on the joystick position:

- *upon initiation of a trial by the participant, the medium size was presented on the screen (300 x 400pixels).*
- *When the joystick was pulled by approx. 7 DEG the picture was replaced by the same picture in size 360 X 480.*
- *When it was pulled further to approx. 15 DEG the picture appeared in size 420 x 560.*
- *Upon further pulling of the joystick to approx. 22 DEG, the picture appeared in size 510 x 680.*
- *Finally, the picture disappeared when the joystick was moved to about 30 DEG*
- *Correspondingly, pushing the joystick away from the middle position by approx. 7, 15, and 22 DEG caused the picture to appear in sizes 225 x 300, 165 x 220, and 99 x 132, respectively, such that each back-and-forth movement of the joystick created a series of changes in the size of the picture.*
- *This zooming effect created the visual impression that pulling the joystick made the pictures come closer, and that pushing the joystick made them disappear*

Keyboard Inputs – Participants press arrow keys multiple times

There is precedent with Mannikin based AATs to instruct the user to press the up or down arrow to move the figure toward or away from a word. I believe this is enough evidence to propose that this same approach is adopted for pushing or pulling images.

De Houwer, J., Crombez, G., Baeyens, F., & Hermans, D. (2001). On the generality of the affective Simon effect. *Cognition & Emotion*, 15(2), 189-206.

https://www.researchgate.net/profile/Jan_De_Houwer/publication/247515192_On_the_generality_of_the_affective_Simon_effect/links/5472eb1f0cf2d67fc035d1db.pdf

Participants could make the manikin move upwards by pressing the key “8” on the numeric part of the keyboard and could make it move downwards by pressing the key “2” on the numeric part of the keyboard. Each time one of these keys was pressed, the manikin moved 20 pixels in the appropriate direction.

Krieglmeyer, R., & Deutsch, R. (2010). Comparing measures of approach–avoidance behaviour: The manikin task vs. two versions of the joystick task. *Cognition and emotion*, 24(5), 810-828.

Manikin task

Following De Houwer et al. (2001), participants moved the manikin upwards or downwards by repeatedly pressing the “8” or “2” keys, respectively, of the numerical keyboard with their middle finger....Depending on conditions, participants were instructed to move with the manikin towards positive words and to move with the manikin away from negative words, or vice versa. They were instructed to respond as fast and as accurately as possible. Participants had to press the respective key three times to move the manikin across the screen. Each key press moved the manikin 38 pixels.

Sideways AAT - Neutral Treatment Left and Right Movement

Comparing the Rinck & Becker procedures above, and those of Taylor & Amir below, a movement of the joystick by 30 degrees in any direction resulted in the image to scale or shift and then disappear. An analogous keyboard sideways trial would then be an equivalent number of keystrokes to the left and right as the push and pull (3 keystrokes, then the image disappears on the fourth).

The table below provides a proposed image location for each keystroke for reference (see Excel spreadsheet and PDF file that accompanies this document).

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Suggested Image X-Axis Position (+/-) Based on Taylor & Amir, 2012

Image	Original Sizes		Joystick X Axis Angle (DEG)	Arrow Key	% of Screen		% of Med Size		X-Axis Image Location (From Center of Screen)		New Resolution Derived X-axis location
	W	H			W	H	W	H	Pixels	%	Pixels
Left #1	400	300	-7	1 Left	39.06%	39.06%	100%	100%	0	0%	0
Left #2	400	300	-15	2 Left	39.06%	39.06%	100%	100%	-171	-33%	-321
Left #3	400	300	-22	3 Left	39.06%	39.06%	100%	100%	-342	-67%	-641
Left #4	400	300	-30	4 Left	39.06%	39.06%	100%	100%	-512	-100%	-960
Right #1	400	300	7	1 Right	39.06%	39.06%	100%	100%	0	0	0
Right #2	400	300	15	2 Right	39.06%	39.06%	100%	100%	171	33%	321
Right #3	400	300	22	3 Right	39.06%	39.06%	100%	100%	342	67%	641
Right #4	400	300	30	4 Right	39.06%	39.06%	100%	100%	512	100%	960

Experimental Condition Example (per Taylor & Amir, 2012)

“To experimentally manipulate automatic action tendencies, the assessment AAT was changed in several ways. First, we used only positive and neutral face stimuli. Second, we replaced push (avoidance) trials with sideways control trials (see Kawakami et al., 2007) in which participants were required to move the joystick to the right when presented with a beige colored border. We eliminated push trials during the manipulation phase for two main reasons: First, our primary aim was to manipulate the approach dimension of automatic action tendencies rather than manipulating both approach and avoidance dimensions. Thus, we wanted to isolate the effects of increasing approach tendencies for positive stimuli as opposed to both increasing approach for positive stimuli and increasing avoidance of neutral stimuli.”

Reference Studies – Sideways AAT Trials

Taylor, C. T., & Amir, N. (2012). Modifying automatic approach action tendencies in individuals with elevated social anxiety symptoms. *Behaviour Research and Therapy*, 50(9), 529–536.

<https://doi.org/10.1016/j.brat.2012.05.004> or <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3408559/>

Kawakami, K., Phillips, C. E., Steele, J. R., & Dovidio, J. F. (2007). (Close) distance makes the heart grow fonder: Improving implicit racial attitudes and interracial interactions through approach behaviors. *Journal of personality and social psychology*, 92(6), 957.

https://www.researchgate.net/profile/Kerry_Kawakami/publication/6290056_Close_Distance_Makes_the_Heart_Grow_Fonder_Improving_Implicit_Racial_Attitudes_and_Interracial_Interactions_Through_Approach_Behaviors/links/562a491908ae22b17031971c.pdf

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Kawakami, K., Steele, J. R., Cifa, C., Phills, C. E., & Dovidio, J. F. (2008). Approaching math increases math= me and math= pleasant. *Journal of Experimental Social Psychology*, 44(3), 818-825.

http://www.yorku.ca/steeleje/research/PDF/Kawakami_et_al_JESP_2008.pdf

US and UK Desktop Screen Resolution 2018-2019

<http://gs.statcounter.com/screen-resolution-stats/desktop/north-america/#monthly-201806-201906-bar>

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Outcome: GORILLA™ AAT Zone Beta

GORILLA™ AAT Zone

The GORILLA™ consultancy team created the AAT as an Advanced zone type that is now available to all users as a Beta.

AAT Zone Configuration

The AAT zone can be configured inside of a given experiment task with the settings shown in the figure below left.

Configuration Settings

The zone defaults to push/pull using up and down arrow keys on a standard keyboard, and stimuli loaded into the platform.

Run as Neutral Trials allows the experimenter to create a sideways AAT per the specification document. When set to yes, the zone expects inputs using the left or right arrow keys and moves the unscaled on-screen image accordingly.

It can be added as a separate task in combination with the default AAT to create a mixture of push/pull and sideways AAT.

Run as Practice Trials displays feedback for a given trial

block.

Feedback text can be set as static, or set to spreadsheet column

(<https://GORILLA™/support/reference/spreadsheet#single-trial>). This text appears in the middle of the trail

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

image, when the participant moves the image in the wrong direction. The size (in px) of the feedback text can be set using the **Feedback text size** setting.

Example AAT

An example of the implementation of a positive approach AAT in GORILLA™. Has been made available by the author via GORILLA™ Open Materials: <https://gorilla.sc/openmaterials/50453>

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Appendix F: Volunteer Stimuli for AAT and IAT

This experimental has been shared with the behavioural science community via Gorilla™ Open Materials:

<https://gorilla.sc/openmaterials/42114>

Experimental Design & Procedures

As there were no pre-existing studies that validated volunteer stimuli for AAT and IAT, a pilot study was adapted from Russo et al. (2018) where participants (n=101, 49 female, 52 male) were asked to categorize 75 pictures into common daily activities (adapted from DePaulo (2019)) with the addition of volunteering. After categorization, participants were asked to rate how well the image matches the category selected on a Likert scale of 1-7. A

within-subjects analysis was completed to identify the top images by proportion categorized as volunteering, rating, and reaction time.

The experimental structure, shown at left, was created as an online within-subjects experiment, hosted on the platform Gorilla™ (Anwyl-Irvine, Massonnié, Flitton, Kirkham, & Evershed, 2019). Participants (n=101, 49 females, 52 males) were recruited through the online Prolific.co (Palan & Schitter, 2018).

Measures

This experiment captured basic demographic information as control variables, along with the following measures as dependent variables.

Table: Volunteer Stimuli Measures

• Most common daily activity Category (see options in right-hand column)• Image Rating (Likert 1-7)• Reaction Time (ms)	• Sleeping and personal care• Leisure and sports• Working• Volunteering• Household activities• Eating and drinking• Educational activities• Purchasing goods and services

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Statistical Analysis of Volunteer Stimuli

All images represented Volunteering in some form, yet the included images were only categorized as representing volunteering 53% of the time.

```
. tabulate catq
```

CatQ	Freq.	Percent	Cum.
Sleep and Personal Care	166	2.15	2.15
Leisure and sports	908	11.73	13.88
Working	1,391	17.98	31.86
Volunteering	4,090	52.86	84.71
Household activities	202	2.61	87.32
Eating and drinking	213	2.75	90.07
Education and learning	605	7.82	97.89
Buying goods and services	163	2.11	100.00
Total	7,738	100.00

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

As shown by the histograms below, most images were ranked as a good fit for the selected category, despite their origin as images of Volunteering”, and in general react times were quite fast across all images and categories.

However, images categorized as “Volunteering” did have statistically significant higher ratings ($\text{Prob} > |z| = 0 < 0.05$) and faster reaction times ($\text{Prob} > |z| = 0 < 0.05$), on average, to those categorized as another category.

```
. ranksum rating, by(vol) porder
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

vol	obs	rank sum	expected
0	3647	12230513	14108420
1	4089	17696204	15818297
combined	7736	29926716	29926716

unadjusted variance 9.615e+09
adjustment for ties -4.310e+08
adjusted variance 9.184e+09

Ho: rating(vol==0) = rating(vol==1)
z = -19.596
Prob > |z| = 0.0000

P{rating(vol==0) > rating(vol==1)} = 0.374

```
. ranksum reactions, by(vol) porder
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

vol	obs	rank sum	expected
0	3648	15462755	14115936
1	4090	14479436	15826255
combined	7738	29942191	29942191

unadjusted variance 9.622e+09
adjustment for ties -44.36054
adjusted variance 9.622e+09

Ho: reacti~s(vol==0) = reacti~s(vol==1)
z = 13.730
Prob > |z| = 0.0000

P{reacti~s(vol==0) > reacti~s(vol==1)} = 0.590

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Ranking of Images

Images were selected and ranked based on Proportion and Rating/ Reaction Time using Microsoft® Office Excel and verified in Stata®.

The
Stata®
Do-file

commands for this experiment can be found below in Appendix G: section 3.

Appendix G: Stata® Do-file Commands

1. Primary Statistical Analysis Stata® Do-file

```
* DO FILE
* Candidate 34484
* MSc, Behavioural Science
* The London School of Economics and Political Science
** Set working directory
cd "C:\LSE\Dissertation\Statistical Analysis"
* create a folder "output" within your working directory
*** set Stata version
version 15.1
* 1. Open the .dta file
use "C:\LSE\Dissertation\Statistical Analysis\ActivateUJS2V_Final_Blck_Stage + Demand.dta", clear
log using depend_var_Act_UJS2V.log
***** Additional Variables *****
* gen female = 1
* replace female = 0 if sex=="Male"
*gen d_lt_intent_to_vol = 0 // No longer needed as now saved in the data set
*replace d_lt_intent_to_vol = 1 if lt_intentq==1 | lt_intentq ==2 /* No longer needed as now saved in the data set
*/
table treat, contents(n lt_intent_to_vol mean lt_intent_to_vol sd lt_intent_to_vol) format (%9.2f)
*gen d_resist = 0 // no longer needed as saved to the data set
*replace d_resist=1 if reactance_q==3 | reactance_q==4 /* no longer needed as saved to the data set */
table treat, contents(n resist mean resist sd resist) format (%9.2f)
table treat, contents(n dem_char_q mean dem_char_q sd dem_char_q) format (%9.3f)
tabulate dem_char_q
tabulate reactance_q
tabulate resist
***** Generate VFI Mean proxy Variable
gen vfi_mean = (vfi_career_sc + vfi_enhance_sc + vfi_protect_sc + vfi_social_sc + vfi_understd_sc +
vfi_values_sc)/6
bysort treat: summarize vfi_mean, detail
*** Validate correlation between VFI Mean and other VFI Scores
pwcorr vfi_career_sc vfi_enhance_sc vfi_protect_sc vfi_social_sc vfi_understd_sc vfi_values_sc , print(.05)
star(.01)
pwcorr vfi_career_sc vfi_enhance_sc vfi_protect_sc vfi_social_sc vfi_understd_sc vfi_values_sc vfi_mean,
print(.05) star(.001) bonferroni
estpost correlate vfi_career_sc vfi_enhance_sc vfi_protect_sc vfi_social_sc vfi_understd_sc vfi_values_sc ,
matrix listwise
esttab, unstack not noobs compress
** verifies that VFI_Mean has a moderate to strong, sig (P<0.001) correlation with the individual VFI scores, and
thus can act as a proxy.
**** Generate Current Volunteer variable, based on response to LT Intent to VOI
gen current_vol =0
replace current_vol=1 if lt_intentq ==1
tab lt_intentq treat, chi2 lrchi2 exact
***** Create Dummy Variables for Interactions *****
*** generate dummy variable "Young" i.e. < than mean of age to
summ age, detail
gen yng = 0
replace yng =1 if age<26.9
*** generate dummy variable yng_treat as a young person in the treatment group
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
gen yng_treat = yng*treat
** genereare dummy variable for being a female in the treatment group
gen fem_treat = female*treat
** genereare dummy variable for high altruism score
summ altruism_score, detail
gen alt_high=0
replace alt_high=1 if altruism_score >1.198787
*** generate dummy var for high_altru in treat and high_altru and female
gen high_alt_treat = alt_high*treat
gen high_alt_fem = alt_high*female
**** Table of all Variables
codebook, compact
*look for and correct missing data
mvpatterns
list sc_iat_blk3_correct if missing(real( sc_iat_blk3_correct ))
* A. ***** Summarize Data *****
codebook, compact
by treat, sort : summarize age student_q eng_fluent lang_count eng_fir_lang pro_edu_lev_q gor_gender_q
gor_unemploy_mnthls altruism_score
tabulate pro_edu_lev_q
tabulate gor_simple_country_q
gen city_country = gor_city + "_" + gor_country_res
table gor_simple_country_q, contents (n altruism_score mean altruism_score sd altruism_score) format (%9.2f)
table gor_simple_country_q, contents (n gor_unemploy_mnthls mean gor_unemploy_mnthls sd
gor_unemploy_mnthls) format (%9.2f)
*output to Participant_Tables.xlsx
pwcorr age2 student_q eng_fluent lang_count eng_fir_lang pro_edu_lev_q gor_gender_q gor_unemploy_mnthls
altruism_score aat_mean aat_median sc_iat_d expl_vol_feel explicit_vol_intent behav_clk gor_simple_country_q
vfi_career_sc vfi_enhance_sc vfi_protect_sc vfi_social_sc vfi_understd_sc vfi_values_sc lt_intentq dem_char_q
reactance_q lt_intent_to_vol resist treat female male gor_simple_country_q , print(.05) star(.01) bonferroni
* graph dot (mean) altruism_score , over( gor_simple_country_q )
sum age
histogram age, normal xline(26.9) ylabel(, angle(horizontal)) title("Age")
graph export "output\basic\age_hist.png", as(png) replace
histogram age, addlabel normal ylabel(, angle(horizontal)) title("Age by Treat/Control Group") by(treat)
graph export "output\basic\age_hist_by_treat.png", as(png) replace
histogram pro_edu_lev_q, discrete ylabel(, angle(horizontal)) xtitle("") xlabel(1(1)4, labszsize(vsmall)
angle(forty_five) valuelabel) title("Education Level") by (treat)
graph export "output\basic\educat_lev_hist_by_treat.png", as(png) replace
sum altruism_score, detail
histogram altruism_score, normal xline(1.198787) ylabel(, angle(horizontal)) title("Altruism Score")
graph export "output\basic\altruism_score_hist.png", as(png) replace
graph box altruism_score, by(treat, title ("Altruism Score by Treatment Group"))
graph export "output\basic\altru_score_box_by_treat.png", as(png) replace
graph box altruism_score, by(gor_gender_q, title ("Altruism Score by Gender"))
graph export "output\basic\altru_score_box_by_gender.png", as(png) replace
graph dot (mean) altruism_score , over(gor_simple_country_q) by(treat, title ("Altruism Score by Country of Res
and Group"))
graph export "output\basic\altru_score_dot_by_country_by_treat.png", as(png) replace
graph dot (mean) altruism_score , over(gor_gender_q) by(treat, title ("Altruism Score by Gender and Group"))
graph export "output\basic\altru_score_dot_by_gender.png", as(png) replace
graph dot (mean) altruism_score , over( gor_age_rng_q ) by(treat, title ("Altruism Score by Age Range and
Group"))
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
graph export "output\basic\altru_score_dot_by_age.png", as(png) replace
graph dot (mean) gor_unemploy_mnth , over( gor_age_rng_q ) title ("Unemployed Mths (mean) by Age Range")
graph export "output\basic\uemploy_dot_by_age.png", as(png) replace
graph dot (mean) gor_unemploy_mnth , yline(17.08356) over( gor_simple_country_q,
sort(gor_unemploy_mnth) descending ) title ("Unemployed Mths(mean) by Country of Res")
graph export "output\basic\uemploy_dot_by_country.png", as(png) replace
*** Tests that all control variables are consistent between Treat and Control
ttest age, by(treat)
prtest student_q, by(treat)
tab student_q treat, chi2 lrchi2 exact
prtest eng_fluent, by(treat)
ttest lang_count, by(treat)
prtest eng_fir_lang, by(treat)
ranksum pro_edu_lev_q, by(treat)
prtest female, by(treat)
ttest gor_unemploy_mnth, by(treat)
ttest gor_unemploy_mnth if gor_unemploy_mnth<60 , by(treat)
ttest altruism_score, by(treat)
tab region_q treat, chi2 lrchi2 exact
ranksum region_q , by(treat)
ranksum gor_simple_country_q , by(treat)
tab gor_simple_country_q treat, chi2 lrchi2 exact
tab pro_gender treat, chi2 lrchi2 exact
** Tests that VFI Scores are consistent between Test and Contro
ttest vfi_enhance_sc , by(treat)
ttest vfi_protect_sc , by(treat)
ttest vfi_protect_sc , by(treat)
ttest vfi_social_sc , by(treat)
ttest vfi_understd_sc , by(treat)
ttest vfi_values_sc , by(treat)
ttest vfi_mean, by(treat)
**** None of the VFI scores differed by treat, P>0.10
*** Demand Charecteristics
gen exper_wanted = 0
replace exper_wanted =1 if dem_char_q==1
ttest exper_wanted, by(treat)
tab resist treat, chi2 lrchi2 exact
tab exper_wanted, chi2 lrchi2 exact
***** Tables of Dependent Variables / IV
table treat, contents(n aat_mean mean aat_mean sd aat_mean ) format (%9.2f)
table treat, contents(n aat_median mean aat_median sd aat_median ) format (%9.2f)
table treat, contents(n sc_iat_d mean sc_iat_d sd sc_iat_d ) format (%9.2f)
table treat, contents(n explicit_vol_intent mean explicit_vol_intent sd explicit_vol_intent ) format (%9.2f)
table treat, contents(n expl_vol_feel mean expl_vol_feel sd expl_vol_feel) format (%9.2f)
table treat, contents(n behav_clk mean behav_clk sd behav_clk) format (%9.2f)
**** Estimate Effect Sizes using Cohen's d.
esize twosample sc_iat_d , by(treat) cohensd
esize twosample expl_vol_feel , by(treat) cohensd
esize twosample explicit_vol_intent , by(treat) cohensd
esize twosample behav_clk , by(treat) cohensd
esize twosample lt_intent_to_vol , by(treat) cohensd
esize twosample aat_mean , by(treat) cohensd
esize twosample aat_median , by(treat) cohensd
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
* B. ***** Analyze AAT Verify if the Manipulation Worked *****
** Provide the descriptive statistics of AAT_MEAN / AAT_MEDIAN
summarize aat_mean aat_median, detail
bysort treat: summarize aat_mean
histogram aat_mean, lwidth(thin) freq normal xline(533.8532, lcolor(blue)) ylabel(, angle(horizontal)) title("AAT Mean")
graph export "output\aat_mean_hist.png", as(png) replace
*** xlabel (0(1)25) will label between 0 and 25, and count by 1.
** Correlation can be shown using \ "graph twoway (scatter altruism_score age)"
sktest aat_mean
sktest aat_mean if treat==0
sktest aat_mean if treat==1
swilk aat_mean
twoway (histogram aat_mean if treat==0, lwidth(thin) lcolor(cranberry) fcolor(gray%10) freq width(25))(histogram aat_mean if treat==1, lcolor(green) fcolor(green%10) lwidth(thin)freq width(25)),legend(order(1 "Control" 2 "Treatment"))
graph export "output\aat_mean_hist_by_treat.png", as(png) replace
graph box aat_mean, over(treat) yline(533.8532) title("AAT Mean")
graph export "output\aat_mean_box_by_treat.png", as(png) replace
graph box aat_mean, over(gor_age_rng_q) by(treat, title("AAT Mean Time by Age"))
graph export "output\aat_mean_box_over_age_by_treat.png", as(png) replace
ttest aat_mean, by(treat)
ranksum aat_mean, by(treat)
anova aat_mean treat
*logit treat aat_mean
*probit treat aat_mean
* C. ***** SC-IATD Analysis *****
**** 1. Descriptive Stats SC-IATD
table treat, contents(n sc_iat_d mean sc_iat_d sd sc_iat_d ) format (%9.2f)

summarize sc_iat_d, detail
bysort treat: summarize sc_iat_d, detail
histogram sc_iat_d, lwidth(thin) freq normal xline(0.143554, lcolor(blue)) ylabel(, angle(horizontal)) title("SC-IAT D")
graph export "output\sc_iat_d_hist.png", as(png) replace
twoway (histogram sc_iat_d if treat==0, width(0.15) lwidth(thin) lcolor(cranberry) fcolor(gray%10) freq )(histogram sc_iat_d if treat==1, width(0.15) lcolor(green) fcolor(green%10) lwidth(thin)freq ),legend(order(1 "Control" 2 "Treatment")) title("SC-IATD Distribution for Control and Treatment Groups")
graph export "output\sc_iat_d_hist_by_treat.png", as(png) replace
graph box sc_iat_d, over(treat) yline(0.143554) title("SC-IAT D")
graph export "output\sc_iat_d_box_by_treat.png", as(png) replace
graph box sc_iat_d, over(gor_age_rng_q) by(treat, title("SC IAT D by Age"))
graph export "output\sc_iat_d_box_by_age_treat.png", as(png) replace
graph box sc_iat_d if gor_unemploy_mnth<60 over(treat) over(gor_age_rng_q) over(female) by(, title("SC IAT D by Region, Age Range, and Gender")) by(region_q)
graph export "output\iatd_box_Region_Age_Gen.png", as(png) replace
**** 2. Test for normality
sktest sc_iat_d
sktest sc_iat_d if treat==0
sktest sc_iat_d if treat==1
swilk sc_iat_d
**** 3. Test for significance
ttest sc_iat_d, by(treat)
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
ranksum sc_iat_d, by(treat) porder
*** 4. Basic ANOVA
anova sc_iat_d treat
**** 3. Correlations of Dep Variable to Control variables
    * Prefer approach below
    *pworth sc_iat_d sc_iat_d treat female age altruism_score gor_unemploy_mnths vfi_mean eng_fluent
eng_fir_lang pro_edu_lev_q gor_age_rng_q gor_country_res_q gor_unemploy_mnths altruism_score, print(.05)
star(.01) bonferroni
estpost correlate sc_iat_d treat female age altruism_score gor_unemploy_mnths vfi_mean pro_edu_lev_q
student_q , matrix listwise
esttab, unstack not noobs compress
**** 4. Estimate Effect Size
    * calc effect size, by treat
    esize twosample sc_iat_d, by(treat) all
**** 5. Primary Regression Analysis
twoway (lfit sc_iat_d treat)(pcarrowi 0.143554 0.01 0.143554 0 (1) "SC-IATD Mean = 0.143554", msize(small)
barbsize(tiny)) (pcarrowi 0.1369 0.97 0.1369 1 (9) " M(treat) = 0.1369", msize(small) barbsize(tiny))(pcarrowi
0.1506 0.03 0.1506 0 (3) " M(control) = 0.1506", msize(small) barbsize(tiny)), xlab(0(1)1) yline(0.143554) title("SC-
IATD, by Control(0), and Treat(1)")
graph export "output\sc_iatd_lfit_treat.png", as(png) replace
twoway (lfitci sc_iat_d treat), xlab(0(1)1) title("SC-IATD, by Control(0), and Treat(1)")
graph export "output\sc_iatd_lfitci_treat.png", as(png) replace
regress sc_iat_d i.treat

**** 6. Multivariate Regression
regress sc_iat_d treat female age altruism_score gor_unemploy_mnths vfi_mean
*regress sc_iat_d i.treat i.female age altruism_score gor_unemploy_mnths vfi_mean if gor_unemploy_mnths<60
* regress sc_iat_d treat age i.gor_simple_country_q female altruism_score gor_unemploy_mnths vfi_mean
regress sc_iat_d treat vfi_career_sc vfi_enhance_sc vfi_protect_sc vfi_social_sc vfi_understd_sc vfi_values_sc
*** shows that vfi_values is high *** Include in exploratory analysis
**** 7. Regression Analysis - Interaction Effects
* 1. Test for Interaction between being a female in the treatment group
regress sc_iat_d treat female fem_treat age altruism_score gor_unemploy_mnths vfi_mean
regress sc_iat_d yng treat yng#treat
margins yng#treat
marginsplot, noci title ("Interaction Effects on SC-IATD") subtitle("by being a young person in the treatment grp")
graph export "output\sc_iatd_feel_margins.png", as(png) replace
* D. ***** EXPLICIT - FEELINGS ABOUT VOLUNTEERING *****
summarize expl_vol_feel, detail
bysort treat: summarize expl_vol_feel, detail
*pworth explicit_vol_feel expl_vol_feel age student_q eng_fluent lang_count eng_fir_lang pro_edu_lev_q
gor_gender_q gor_age_rng_q gor_country_res_q gor_unemploy_mnths altruism_score , print(.05) star(.01)
*graph twoway (scatter expl_vol_feel altruism_score) (lfit expl_vol_feel altruism_score), by(treat, title("Explicit
Feelings about Volunteering vs S5 Altruism") subtitle("by Treatment Group"))
graph export "output\explicit_vol_feel_scatter_Altru.png", as(png) replace
histogram expl_vol_feel, discrete freq normal xline( 6.059299, lcolor(blue)) ylabel(, angle(horizontal))
title("Explicit Feelings Toward Volunteering")
(start=1, width=1)
graph export "output\expl_vol_feel_hist.png", as(png) replace
twoway (histogram expl_vol_feel if treat==0, lwidth(thin) lcolor(cranberry) fcolor(gray%10) disc freq
width(1))(histogram expl_vol_feel if treat==1, lcolor(green) fcolor(green%10) lwidth(thin) disc freq
width(1)), legend(order(1 "Control" 2 "Treatment")) title("Explicit Feelings Toward Volunteering") subtitle("for
Control and Treatment Groups")
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
graph export "output\expl_vol_feel_hist_by_treat.png", as(png) replace
*graph box expl_vol_feel, over(treat) yline( 6.059299) title("Explicit Feelings Toward Volunteering")
*graph export "output\expl_vol_feel_box_by_treat.png", as(png) replace
*graph box expl_vol_feel if gor_unemploy_mnth<60 & (region_q ==1 | region_q==2) & gor_age_rng_q <4,
over(treat) over(gor_age_rng_q) over(female) by(, title("Explicit Feelings Toward Volunteering") subtitle("by
Region, Age Range, and Gender")) by(region_q)
*graph export "output\expl_vol_feel_box.png", as(png) replace
** Note that Males in NA 25-30 and Females in Europe 25-30 had higher TREAT
sktest expl_vol_feel
sktest expl_vol_feel if treat==0
sktest expl_vol_feel if treat==1
swilk expl_vol_feel
ttest expl_vol_feel, by(treat)
ranksum expl_vol_feel, by(treat) porder
*** Categorical variable. Can use Chi2
tab treat expl_vol_feel, chi2
** Fisher's exact test
tab treat expl_vol_feel, exact
anova treat expl_vol_feel
*** Categorical variable, but not Binary, could use Ordinal Logistic Regression = ologit
ologit expl_vol_feel treat , nolog
*probit treat expl_vol_feel
logit expl_vol_feel treat if gor_age_rng_q ==2 & region_q==1 & male==1
logit expl_vol_feel treat if gor_age_rng_q ==2 & region_q==2 & female==1
*** Exploratory Analysis *****
*** Males in US, and Females in Europe Ages 25-30
*ttest expl_vol_feel if gor_age_rng_q ==2 & ((region_q==2 & female==1) | region_q==1 & female==0), by(treat)
*regress expl_vol_feel treat if gor_age_rng_q ==2 & ((region_q==2 & female==1) | region_q==1 & female==0)
*ologit expl_vol_feel treat if gor_age_rng_q ==2 & ((region_q==2 & female==1) | region_q==1 & female==0)
**** 3. Correlations of Dep Variable to Control variables
* Prefer model below
*pwcorr expl_vol_feel expl_vol_feel treat female age altruism_score gor_unemploy_mnth<60 vfi_mean
eng_fluent eng_fir_lang pro_edu_lev_q gor_age_rng_q gor_country_res_q gor_unemploy_mnth<60 altruism_score,
print(.05) star(.01) bonferroni
estpost correlate expl_vol_feel treat female age altruism_score gor_unemploy_mnth<60 vfi_mean pro_edu_lev_q
gor_country_res_q gor_unemploy_mnth<60 altruism_score , matrix listwise
esttab, unstack not noobs compress
**** 4. Estimate Effect Size
* calc effect size, by treat
esize twosample expl_vol_feel, by(treat) all
**** 5. Primary Regression Analysis
twoway (lfit expl_vol_feel treat)(pcarrowi 6.05 0.01 6.05 0 (1) "EFTV Mean = 6.05",msize(small) barbsize(tiny))
(pcarrowi 6.01 0.97 6.01 1 (9) " M(treat) = 6.01", msize(small) barbsize(tiny))(pcarrowi 6.11 0.03 6.11 0 (3) "
M(control) = 6.11", msize(small) barbsize(tiny)), xlab(0(1)1) yline(6.05) title("Explicit Feelings Toward
Volunteering") subtitle("by Control(0), and Treat(1)")
graph export "output\expl_vol_feel_lfit_treat.png", as(png) replace
twoway (lfitci expl_vol_feel treat), xlab(0(1)1) title("Explicit Feelings Toward Volunteering") subtitle("by
Control(0), and Treat(1)")
graph export "output\expl_vol_feel_lfitci_treat.png", as(png) replace
regress expl_vol_feel treat female age altruism_score gor_unemploy_mnth<60 vfi_mean
ologit expl_vol_feel treat female age altruism_score gor_unemploy_mnth<60 vfi_mean, nolog
ologit expl_vol_feel vfi_career_sc vfi_enhance_sc vfi_protect_sc vfi_social_sc vfi_understd_sc vfi_values_sc,nolog
*** shows that vfi_values is high *** Include in exploratory analysis
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

**** 7. Interaction Effects - Regression

* 1. Test for Interaction between being a female in the treatment group

```
regress expl_vol_feel treat female fem_treat age altruism_score gor_unemploy_mnths vfi_mean if  
gor_unemploy_mnths<60
```

* 2. Test for Interaction between being a young person in the treatment group

```
regress expl_vol_feel treat age yng_treat female altruism_score gor_unemploy_mnths vfi_mean if  
gor_unemploy_mnths<60
```

* 3. Test for Interaction between being treatment group and having a high altruism score

```
regress expl_vol_feel treat altruism_score high_alt_treat age female gor_unemploy_mnths vfi_mean if  
gor_unemploy_mnth<60
```

* 4. Test for Interaction between being female and having a high altruism score

```
regress expl_vol_feel female altruism_score high_alt_fem treat age female gor_unemploy_mnths vfi_mean if  
gor_unemploy_mnth<60
```

```
regress expl_vol_feel yng treat yng#treat
```

```
margins yng#treat
```

```
marginsplot, noci title ("Interaction Effects on EFTV") subtitle("by being a young person in the treatment grp")
```

```
graph export "output\expl_vol_feel_margins.png", as(png) replace
```

* E. ***** EXPLICIT - INTENT TO VOLUNTEER

```
*pwcrr explicit_vol_intent expl_vol_feel age student_q eng_fluent lang_count eng_fir_lang pro_edu_lev_q  
gor_gender_q gor_age_rng_q gor_country_res_q gor_unemploy_mnths altruism_score, print(.05) star(.01)
```

```
graph twoway (scatter explicit_vol_intent altruism_score) (lfit explicit_vol_intent altruism_score), by(treat,  
title("Explicit Intent to Volunteer vs S5 Altruism") subtitle("by Treatment Group"))
```

```
graph export "output\explicit_vol_intent_scatter_Altru.png", as(png) replace
```

```
summarize explicit_vol_intent, detail
```

```
bysort treat: summarize explicit_vol_intent
```

```
histogram explicit_vol_intent, lwidth(thin) freq normal xline(4.460916, lcolor(blue)) ylabel(, angle(horizontal))  
title("Explicit Intent to Volunteer")
```

```
graph export "output\explicit_vol_intent_hist.png", as(png) replace
```

```
graph box explicit_vol_intent if gor_unemploy_mnths<60 & (region_q ==1 | region_q==2) & gor_age_rng_q <4,  
over(treat) over(gor_age_rng_q) over(female) by(, title("Explicit Intent to Volunteer") subtitle("by Region, Age  
Range, and Gender")) by(region_q)
```

```
graph export "output\explicit_vol_intent_box_Reg_Age_Gen.png", as(png) replace
```

```
sktest explicit_vol_intent
```

```
sktest explicit_vol_intent if treat==0
```

```
sktest explicit_vol_intent if treat==1
```

```
twoway (histogram explicit_vol_intent if treat==0, lwidth(thin) lcolor(cranberry) fcolor(gray%10) freq)(histogram  
explicit_vol_intent if treat==1, lcolor(green) fcolor(green%10) lwidth(thin)freq),legend(order(1 "Control" 2  
"Treatment"))
```

```
graph export "output\explicit_vol_intent_hist_by_treat.png", as(png) replace
```

```
*graph box explicit_vol_intent, over(treat) yline(4.460916) title("Explicit Intent to Volunteer")
```

```
*graph export "output\explicit_vol_intent_box_by_treat.png", as(png) replace
```

```
ttest explicit_vol_intent, by(treat)
```

** Mann-Whitney

```
ranksum explicit_vol_intent, by(treat) porder
```

** Categorical Variable, can use...

```
tab treat explicit_vol_intent, chi2
```

```
tab treat explicit_vol_intent, exact
```

**** 3. Correlations of Dep Variable to Control variables

* Prefer model below

```
*pwcrr explicit_vol_intent explicit_vol_intent treat female age altruism_score gor_unemploy_mnths vfi_mean  
eng_fluent eng_fir_lang pro_edu_lev_q gor_age_rng_q gor_country_res_q gor_unemploy_mnths altruism_score,  
print(.05) star(.01) bonferroni
```


ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
estpost correlate explicit_vol_intent treat female age altruism_score gor_unemploy_mnths vfi_mean
pro_edu_lev_q gor_country_res_q gor_unemploy_mnths altruism_score ,      matrix listwise
esttab, unstack not noobs compress
**** 4. Estimate Effect Size
* calc effect size, by treat
esize twosample explicit_vol_intent, by(treat) all
****5. ANOVA
anova explicit_vol_intent i.treat
**** 6. Primary Regression Analysis
twoway (lfit explicit_vol_intent treat)(pcarrowi 4.460916 0.01 4.460916 0 (1) "EI2V Mean = 4.4609",msize(small)
barbsize(tiny)) (pcarrowi 4.460733 0.99 4.460733 1 (9) " M(treat) = 4.4607", msize(small) barbsize(tiny))(pcarrowi
4.461111 0.01 4.461111 0 (3) " M(control) = 4.4611", msize(small) barbsize(tiny)), xlab(0(1)1) yline(4.460916)
title("Explicit Intent to Volunteer") subtitle("by Control(0), and Treat(1)")
graph export "output\expl_vol_intent_lfit_treat.png", as(png) replace
twoway (lfitci explicit_vol_intent treat), xlab(0(1)1) title("Explicit Intent to Volunteer") subtitle("by Control(0),
and Treat(1)")
graph export "output\expl_vol_intent_lfitci_treat.png", as(png) replace
ologit expl_vol_feel treat female age altruism_score gor_unemploy_mnths vfi_mean, nolog
regress explicit_vol_intent treat female age altruism_score gor_unemploy_mnths vfi_mean
regress explicit_vol_intent treat female age altruism_score gor_unemploy_mnths vfi_mean if
gor_unemploy_mnths<60
regress explicit_vol_intent vfi_career_sc vfi_enhance_sc vfi_protect_sc vfi_social_sc vfi_understd_sc
vfi_values_sc
*** shows that vfi_values is high *** Include in exploratory analysis
**** 7. Secondary Regression Analysis - Test for Interaction effects
* 1. Test for Interaction between being a female in the treatment group
regress explicit_vol_intent treat female fem_treat age altruism_score gor_unemploy_mnths vfi_mean if
gor_unemploy_mnths<60
* 2. Test for Interaction between being a young person in the treatment group
regress explicit_vol_intent treat age yng_treat female altruism_score gor_unemploy_mnths vfi_mean if
gor_unemploy_mnths<60
* 3. Test for Interaction between being treatment group and having a high altruism score
regress explicit_vol_intent treat altruism_score high_alt_treat age female gor_unemploy_mnths vfi_mean if
gor_unemploy_mnth<60
* 4. Test for Interaction between being female and having a high altruism score
regress explicit_vol_intent female altruism_score high_alt_fem treat age female gor_unemploy_mnths vfi_mean
if gor_unemploy_mnth<60
regress explicit_vol_intent yng treat yng#treat
margins yng#treat
marginsplot, noci title ("Interaction Effects on EIFV") subtitle("by being a young person in the treatment grp")
graph export "output\expl_vol_intent_margins.png", as(png) replace
*F. ***** Long-Term Intent to Volunteer ***** BINARY VARIABLE *****
summarize lt_intent_to_vol, detail
bysort treat: summarize lt_intent_to_vol, detail
table lt_intentq
table lt_intentq treat
** Note that in the table above, 44 people are currently volunteering. This may not be all, but could be an
indicator.
graph dot (mean) lt_intent_to_vol, over(treat) title ("Long-Term Intent to Volunteer")
graph export "output\lt_intent_to_vol_dot_by_treat.png", as(png) replace
*graph bar (mean) lt_intent_to_vol, over(treat)
tab treat lt_intent_to_vol , chi2
tab treat lt_intent_to_vol , exact
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
prtest lt_intent_to_vol, by(treat)
graph dot (mean) lt_intent_to_vol, over(treat) title ("Long-Term Intent to Volunteer")
graph export "output\lt_intent_to_vol_dot_by_treat.png", as(png) replace
**** 3. Correlations of Dep Variable to Control variables
* Prefer model below
*pwcorr lt_intent_to_vol lt_intent_to_vol treat female age altruism_score gor_unemploy_mnths vfi_mean
eng_fluent eng_fir_lang pro_edu_lev_q gor_age_rng_q gor_country_res_q gor_unemploy_mnths altruism_score,
print(.05) star(.01) bonferroni
estpost correlate lt_intent_to_vol treat female age altruism_score gor_unemploy_mnths vfi_mean
pro_edu_lev_q gor_country_res_q gor_unemploy_mnths altruism_score, matrix listwise
esttab, unstack not noobs compress
**** 4. Estimate Effect Size
* calc effect size, by treat
esize twosample lt_intent_to_vol, by(treat) all
logit lt_intent_to_vol treat
probit lt_intent_to_vol treat age
**** 5. ANOVA & Primary Regression Analysis
anova lt_intent_to_vol treat
regress lt_intent_to_vol treat
logit lt_intent_to_vol treat female age altruism_score gor_unemploy_mnths vfi_mean, nolog
logit lt_intent_to_vol treat female age altruism_score gor_unemploy_mnths vfi_mean if
gor_unemploy_mnths<60
logit lt_intent_to_vol vfi_career_sc vfi_enhance_sc vfi_protect_sc vfi_social_sc vfi_understd_sc vfi_values_sc
*** shows that vfi_values is high *** Include in exploratory analysis
*twoway (lfit lt_intent_to_vol treat)(pcarrowi 4.460916 0.01 4.460916 0 (1) "EI2V Mean = 4.4609", msize(small)
barbsize(tiny)) (pcarrowi 4.460733 0.99 4.460733 1 (9) " M(treat) = 4.4607", msize(small) barbsize(tiny))(pcarrowi
4.461111 0.01 4.461111 0 (3) " M(control) = 4.4611", msize(small) barbsize(tiny)), xlab(0(1)1) yline(4.460916)
title("Explicit Intent to Volunteer") subtitle("by Control(0), and Treat(1)")
*graph export "output\expl_vol_intent_lfit_treat.png", as(png) replace
twoway (lfitci lt_intent_to_vol treat), xlab(0(1)1) title("Long-Term Intent to Volunteer") subtitle("by Control(0),
and Treat(1)")
graph export "output\lt_intent_to_vol_lfitci_treat.png", as(png) replace
**** 6. Secondary Regression Analysis - Test for Interaction Effects
* 1. Test for Interaction between being a female in the treatment group
*regress lt_intent_to_vol treat female fem_treat age altruism_score gor_unemploy_mnths vfi_mean if
gor_unemploy_mnths<60
* 2. Test for Interaction between being a young person in the treatment group
regress lt_intent_to_vol treat age yng_treat female altruism_score gor_unemploy_mnths vfi_mean if
gor_unemploy_mnths<60
* 3. Test for Interaction between being treatment group and having a high altruism score
regress lt_intent_to_vol treat altruism_score high_alt_treat age female gor_unemploy_mnths vfi_mean if
gor_unemploy_mnth<60
* 4. Test for Interaction between being female and having a high altruism score
regress lt_intent_to_vol female altruism_score high_alt_fem treat age female gor_unemploy_mnths vfi_mean if
gor_unemploy_mnth<60
logit lt_intent_to_vol treat yng#treat
margins yng#treat
marginsplot, noci title ("Interaction Effects on LT Intent to Volunteer") subtitle("by being a young person in the
treatment grp")
graph export "output\lt_intent_to_vol_margins.png", as(png) replace
* G ***** Behaviour - Click Through ***** BINARY VARIABLE *****
summarize behav_clk, detail
bysort treat: summarize behav_clk, detail
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
tab treat behav_clk , chi2
tab treat behav_clk , exact
prtest behav_clk, by(treat)
graph dot (mean) behav_clk, over(treat) title ("Behavioural - Click Through by Treat")
graph export "output\behav_clk_dot_by_treat.png", as(png) replace
**** 3. Correlations of Dep Variable to Control variables
* Prefer model below
*pwcorr behav_clk behav_clk treat female age altruism_score gor_unemploy_mnths vfi_mean eng_fluent
eng_fir_lang pro_edu_lev_q gor_age_rng_q gor_country_res_q gor_unemploy_mnths altruism_score, print(.05)
star(.01) bonferroni
estpost correlate behav_clk treat female age altruism_score gor_unemploy_mnths vfi_mean pro_edu_lev_q
gor_country_res_q gor_unemploy_mnths altruism_score , matrix listwise
esttab, unstack not noobs compress
**** 4. Estimate Effect Size
* calc effect size, by treat
esize twosample behav_clk, by(treat) all
bootstrap r(d) r(g), reps(500) nowarn: esize twosample behav_clk, by(treat)
**** 5. Primary Regression Analysis
anova behav_clk treat
regress behav_clk treat
logit behav_clk treat
** check for goodness of fit post Logit
estat classification
**** exact logistic regression
exlogistic behav_clk treat, nolog
*probit behav_clk treat
**** 5b) Multiple Linear Regression
logit behav_clk treat female age altruism_score gor_unemploy_mnths vfi_mean, nolog
regress behav_clk treat female age altruism_score gor_unemploy_mnths vfi_mean if gor_unemploy_mnths<60
probit behav_clk treat female age altruism_score gor_unemploy_mnths vfi_mean if gor_unemploy_mnths<60
regress behav_clk vfi_career_sc vfi_enhance_sc vfi_protect_sc vfi_social_sc vfi_understd_sc vfi_values_sc
*** shows that vfi_values is high *** Include in exploratory analysis
twoway (lfit behav_clk treat)(pcarrowi 0.1778976 0.01 0.1778976 0 (1) "BeCt Mean = 0.1779", msize(small)
barbsize(tiny)) (pcarrowi 0.1413613 0.99 0.1413613 1 (9) " M(treat) = 0.1414", msize(small)
barbsize(tiny))(pcarrowi .2166667 0.01 .2166667 0 (3) " M(control) = 0.2167", msize(small) barbsize(tiny)),
xlab(0(1)1) yline(0.1778976) title("Behavioural: Click-Through Rate ") subtitle("by Control(0), and Treat(1)")
graph export "output\Behaveclk_lfit_treat.png", as(png) replace
twoway (lfitci behav_clk treat), xlab(0(1)1) yline(0.1778976) title("Explicit Intent to Volunteer") subtitle("by
Control(0), and Treat(1)")
graph export "output\Behaveclk_lfitci_treat.png", as(png) replace
**** 8. Secondary Regression Analysis - Test for Interaction Effects
* 1. Test for Interaction between being a female in the treatment group
regress behav_clk treat female fem_treat age altruism_score gor_unemploy_mnths vfi_mean if
gor_unemploy_mnths<60
* 2. Test for Interaction between being a young person in the treatment group
regress behav_clk treat age yng_treat female altruism_score gor_unemploy_mnths vfi_mean if
gor_unemploy_mnths<60
* 3. Test for Interaction between being treatment group and having a high altruism score
regress behav_clk treat altruism_score high_alt_treat age female gor_unemploy_mnths vfi_mean if
gor_unemploy_mnth<60
* 4. Test for Interaction between being female and having a high altruism score
regress behav_clk female altruism_score high_alt_fem treat age female gor_unemploy_mnths vfi_mean if
gor_unemploy_mnth<60
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
logit behav_clk treat yng#treat
margins yng#treat
marginsplot, noci title ("Interaction Effects on Behavioural: Click Through") subtitle("by being a young person in
the treatment grp")
graph export "output\behave_clk_margins.png", as(png) replace
```

2. Data Exclusion – Stata® Do-file

* DO FILE – Data Quality / Exclusion

* Candidate 34484

* MSc, Behavioural Science

* The London School of Economics and Political Science

** Set working directory

```
cd "C:\Users\Jon\Desktop\LSE\Dissertation\Statistical Analysis\Data\Data Preparation\Quality"
```

* create a folder "output" within your working directory

*** set Stata version

```
version 15.1
```

* A. ***** Validation of Duration *****

```
use "C:\LSE\Dissertation\Statistical Analysis\Data\Data Preparation\Quality\All_duration.dta"
```

```
log using all_dur_qual.log
```

```
summarize tot_dur_s, detail
```

```
histogram tot_dur_s, frequency addlabel normal xline(1023.442) ylabel(, angle(horizontal)) title("Histogram of
Total Duration (s)")
```

```
graph export "stata_output\total_dur_hist.png", as(png) replace
```

* 3. Generate Log of Total Duration & Describe

```
gen log_tot_dur_s = ln(tot_dur_s)
```

```
summarize log_tot_dur_s, detail
```

```
histogram log_tot_dur_s, frequency addlabel normal xline(6.892475) xline(6.421069) xline(7.677873) ylabel(,
angle(horizontal)) title("Histogram - Log of Total Duration (s)")
```

```
graph export "stata_output\log_total_dur_hist.png", as(png) replace
```

* 4. Indicate Outliers based on P1, P99

```
generate outlier = 0
```

```
replace outlier = 1 if log_tot_dur_s < 6.421069
```

```
replace outlier = 1 if log_tot_dur_s > 7.677873
```

```
close log
```

* B. ***** ALTRUISM Mahalanobis Distance *****

```
use "C:\LSE\Dissertation\Statistical Analysis\Data\Data Preparation\Quality\Altruism.dta"
```

```
log using altru_maha_qual.log
```

* 2. Provide the descriptive statistics of the dependent variables.

```
summarize alt_score, detail
```

```
summarize alt_dur_ms, detail
```

```
histogram alt_score, frequency addlabel normal xline(1.16) ylabel(, angle(horizontal)) title("Histogram of Altruism
Score")
```

```
graph export "stata_output\altruism_score_hist.png", as(png) replace
```

```
histogram alt_dur_ms, frequency addlabel normal xline(43469.63) ylabel(, angle(horizontal)) title("Histogram of
Altruism Questionnaire Duration (ms)")
```

```
graph export "stata_output\altruism_dur_hist.png", as(png) replace
```

* 3. Clear that duration is lognormal distribution. Generate log_duration variable to normalize

```
gen log_dur = ln(alt_dur_ms)
```

* 4. Summarize and Hist of log_dur

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
summarize log_dur, detail
histogram log_dur, frequency addlabel normal xline(10.44) ylabel(, angle(horizontal)) title("Histogram of Log
Altruism Duration (ms)")
graph export "stata_output\alt_log_dur_hist.png", as(png) replace
* 5. Calculate the Square of Mahalanobis Distance of each observation versus the Mean and generate a new
variable
mahascore alt_score log_dur, gen(mahdist_sc_logdur_sq) refmeans compute
*6. generate Mahalanobis Distance into new variable
gen mahdist_sc_logdur = sqrt( mahdist_sc_logdur_sq )
* 7. Descriptive Stats of MDist
summarize mahdist_sc_logdur, detail
*note Mean, 99th, 1st Percentile
histogram mahdist_sc_logdur, frequency addlabel normal xline(1.237) xline(0.1413) xline(3.334) ylabel(,
angle(horizontal)) title("Histogram of MahaDist (Altruism Score, LogDuration)")
graph export "stata_output\alt_log_dur_hist.png", as(png) replace
* 8. Generate Outlier variable, remove outliers
gen outlier = 0
replace outlier = 0 if mahdist_sc_logdur > 3.334316
replace outlier = 1 if mahdist_sc_logdur < .1413137
close log
* C. ***** Consent Review Duration vs. # of Characters vs. Read Time *****
*** Not a good Measure ***
use "C:\LSE\Dissertation\Statistical Analysis\Data\Data Preparation\Quality\consent_dur.dta"
log using consent_qual.log
* 2. Provide the descriptive statistics of the dependent variables.
summarize log_cons_dur_s, detail
histogram log_cons_dur_s, frequency addlabel normal xline(2.9515) ylabel(, angle(horizontal)) title("Histogram of
LN Consent Duration (ms)")
graph export "output\consent_dur_hist.png", as(png) replace
* 3. Indicate Outliers based on P1, P99
generate outlier = 0
replace outlier = 1 if log_cons_dur_s < 1.22
replace outlier = 1 if log_cons_dur_s > 5.3
close log
* D. ***** Review SC-IATD Incorrect *****
use "C:\LSE\Dissertation\Statistical Analysis\Data\Data Preparation\Quality\sc-iat_sep_21.dta"
log using sc-iat_error_qual.log
summarize incorrect, detail
histogram incorrect, frequency addlabel normal xline(0.0595691) xline(0.26154) xline(.0595691) ylabel(,
angle(horizontal)) title("Histogram of SC-IAT Errors")
graph export "stata_output\sciat_error_hist.png", as(png) replace
summarize duration, detail
histogram duration, frequency addlabel normal xline(374.3936) xline(269) xline(655) ylabel(, angle(horizontal))
title("Histogram of SC-IAT Duration")
graph export "stata_output\sciat_duration_hist.png", as(png) replace
gen log_dur = ln(duration)
summarize log_dur, detail
histogram log_dur, frequency addlabel normal xline(5.91) xline(5.595) xline(6.485) ylabel(, angle(horizontal))
title("Histogram of SC-IAT Log Duration")
graph export "stata_output\sciat_log_dur_hist.png", as(png) replace
twoway (scatter incorrect duration, msize(small))
twoway (scatter incorrect duration if incorrect > 0.1, msize(small))
graph export "stata_output\sciat_duration_hist.png", as(png) replace
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
twoway (scatter incorrect duration if incorrect > 0.1, msize(small)) if incorrect > 0.1 & duration < 269
* 3. Indicate Outliers based on P1, P99
* use | for "or" and & for "and"
generate outlier = 0
replace outlier = 1 if incorrect > 0.26153
* replace outlier = 1 if duration < 269.01
*** OR *** replace outlier = 1 if incorrect > 0.26153 | duration < 269.001
*** AND *** replace outlier = 1 if incorrect > 0.26153 & duration < 269.001
** only argument would be to ID only on incorrect% ONLY, or Incorrect & short duration
close log
* E. ***** VFI Inter-Item Quality *****
use "C:\LSE\Dissertation\Statistical Analysis\Data\Data Preparation\Quality\VFI_inter_item_SD.dta"
log using vfi_inter_item_SD_qual.log
summarize interitemsd, detail
histogram interitemsd, frequency addlabel normal xline(1.522896) xline(0.75) xline(3.49) ylabel(,
angle(horizontal)) title("Histogram of VFI Inter-Item SD")
graph export "stata_output\vfi_inter_item_SD_qual_hist.png", as(png) replace
* 8. Generate Outlier variable, remove outliers
gen outlier = 0
replace outlier = 1 if interitemsd > 3.49
* replace outlier = 1 if interitemsd < 0.75
close log
* F. ***** VFI Duration and MAHA Distance *****
use "C:\LSE\Dissertation\Statistical Analysis\Data\Data Preparation\Quality\VFI_after.dta"
log using vfi_maha_qual.log
summarize vfcareer_score vfienhance_score vfiprotect_score vfisocial_score vfiunderstd_score vfivalues_score,
detail
summarize ltintentquantised, detail
summarize vfi_max_long_str, detail
histogram vfcareer_score, frequency addlabel normal xline(4.488614) ylabel(, angle(horizontal)) title("Histogram
of VFI Career Score")
graph export "stata_output\vfcareer_score_hist.png", as(png) replace
histogram vfienhance_score, frequency addlabel normal xline(4.620792) ylabel(, angle(horizontal))
title("Histogram of VFI Enhance Score")
graph export "stata_output\vfienhance_score_hist.png", as(png) replace
histogram vfiprotect_score, frequency addlabel normal xline(3.885149) ylabel(, angle(horizontal))
title("Histogram of VFI Protect Score")
graph export "stata_output\vfiprotect_score_hist.png", as(png) replace
histogram vfisocial_score, frequency addlabel normal xline(3.40396) ylabel(, angle(horizontal)) title("Histogram of
VFI Social Score")
graph export "stata_output\vfisocial_score_hist.png", as(png) replace
histogram vfiunderstd_score, frequency addlabel normal xline(5.210891) ylabel(, angle(horizontal))
title("Histogram of VFI Understanding Score")
graph export "stata_output\vfiunderstd_score_hist.png", as(png) replace
histogram vfivalues_score, frequency addlabel normal xline(5.306436) ylabel(, angle(horizontal)) title("Histogram
of VFI Values Score")
graph export "stata_output\vfivalues_score_hist.png", as(png) replace
histogram ltintentquantised, discrete frequency addlabel normal xline(2.311881) ylabel(, angle(horizontal))
title("Histogram of LT Intent")
graph export "stata_output\vfiprotect_score_hist.png", as(png) replace
histogram vfi_max_long_str, frequency addlabel normal xline(4.175743) ylabel(, angle(horizontal))
title("Histogram of VFI Maximum Long String")
graph export "stata_output\vfi_max_long_str.png", as(png) replace
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
* 3. Clear that duration is lognormal distribution. Generate log_duration variable to normalize
* gen log_dur = ln(alt_dur_ms)
* 4. Summarize and Hist of log_dur
* summarize log_dur, detail
* histogram log_dur, frequency addlabel normal xline(10.44) ylabel(, angle(horizontal)) title("Histogram of Log
Altruism Duration (ms)")
* graph export "stata_output\alt_log_dur_hist.png", as(png) replace
* 5. Calculate the Square of Mahalanobis Distance of each observation versus the Mean and generate a new
variable
mahascore vficareer_score vfienhance_score vfiprotect_score vfisocial_score vfiunderstd_score vfivalues_score ,
gen(mahdist_all_vfi_sq) refmeans compute
*6. generate Mahalanobis Distance into new variable
gen mahdist_all_vfi = sqrt(mahdist_all_vfi_sq)
* 7. Descriptive Stats of MDist
summarize mahdist_all_vfi, detail
*note Mean, 99th, 1st Percentile
histogram mahdist_all_vfi, frequency addlabel normal xline(2.271738) xline(.8408923) xline(5.358401) ylabel(,
angle(horizontal)) title("Histogram of MahaDist All VFI Scores")
graph export "stata_output\vfi_maha_dist_hist.png", as(png) replace
* 8. Generate Outlier variable, remove outliers
gen outlier = 0
replace outlier =1 if mahdist_sc_logdur >3.334316
replace outlier =1 if mahdist_all_vfi < .8408923
**      https://www.stata.com/statalist/archive/2010-05/msg00132.html
**      Re: st: Calculating Mahalanobis distance
**      From    Tirthankar Chakravarty <tirthankar.chakravarty@gmail.com>
**      To      statalist@hsphsun2.harvard.edu
**      Subject Re: st: Calculating Mahalanobis distance
**      Date    Tue, 4 May 2010 03:26:14 +0530
**      Well, I was not after the summary measure of the Mahalanobis distance, rather the distance scores for
each pair of observations, but it turns out that this too is fairly easily achievable using David Kantor's -mahapick-
(SSC) as:
*****
**      sysuse auto, clear
**      mahascore weight length, gen(md_w_l_sq) refmeans compute
**      g md_w_l = sqrt(md_w_l_sq)
**      su md_w_l
*****
log close
```

3. Validating Volunteer Stimuli – Stata® Do-file

```
* DO FILE – Candidate 34484 Volunteer Stimuli Validation
** Set working directory
cd "C:\Users\LSE\Dissertation\Experimental Build\Volunteer Stimuli\Stata\"
* create a folder "output" within your working directory
*** set Stata version
version 15.1
* 1. Open the .dta file and create a .do file and a .log file, add Volunteer Category variable "vol"
log using VolStim.log
generate vol =0
replace vol=1 if catq==4
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

* 2. Provide the descriptive statistics of the dependent variables.

*summarize catq

summarize catq, detail

mean catq

tabulate catq

tabulate image catq

graph bar, over(catq) blabel(bar) title(% by Category) caption("1:Sleep and personal care, 2:Leisure and sports, 3: Working, 4: Volunteering, 5: Household activities, 6: Eating and drinking, 7: Education and Learning, 8:Buying goods and services", size(1.5) position(1)) note(, position(1) box)

graph export "output\CatqBarChart.png", as(png) replace

*summarize rating

summarize rating, detail

mean rating

tabulate rating

histogram rating

graph bar, over(rating) blabel(bar) title(% by Image Fit to Category Rating) caption("1: Very Poor Fit, 7: Very Good Fit", size(2) position(1))

graph export "output\RateBarChart.png", as(png) replace

*summarize ratings for Volunteer Category

summarize rating if vol==1, detail

mean rating if vol==1

tabulate rating if vol==1

histogram rating if vol==1

graph bar if vol==1, over(rating) blabel(bar) title(% by Image Fit to Category Rating) caption("1: Very Poor Fit, 7: Very Good Fit", size(2) position(1))

graph export "output\RateBarChart.png", as(png) replace

*summarize reactions

summarize reactions, detail

mean reactions

tabulate reactions

histogram reactions

graph export "output\ReactHistDens.png", as(png) replace

histogram reactions, fraction

graph export "output\ReactHistFrac.png", as(png) replace

* descriptive statistics of the dependent variable in the control and the treatment groups.

bysort vol: summarize catq, detail

bysort vol: summarize rating, detail

bysort vol: summarize reactions, detail

* graphical description of the Distribution of the dependent variable.

histogram rating, discrete title("Histogram of Category Ratings") subtitle("for all images") caption("1: Very Poor Fit, 7: Very Good Fit", size(2) position(1))

histogram reactions, title("Histogram of Reaction Time (s)") subtitle("for all images")

* 5. Is there a statistically significant difference in ratings and reaction time for images categorized as Volunteering over others?

ranksum rating, by(vol) porder

ranksum reactions, by(vol) porder

twoway (histogram reactions if vol==0, lwidth(thin) lcolor(cranberry) fcolor(gray%10) freq)(histogram reactions if vol==1, lcolor(green) fcolor(green%10) lwidth(thin) freq), legend(order(1 "Not Volunteering" 2 "Volunteering")) title("Reaction Time (s) for Images") subtitle("Categorized as Volunteering or Not")

** This section is intended to investigate the Top 15 Volunteering Images using the Rating/Reaction Times Criteria and is the basis for selection *****

list rating if missing(real(rating))

destring rating, replace

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

```
gen vol_yes = 1 if catq==4
gen rate_react = rating/reactions*vol_yes
histogram rate_react
gen log_rate_react = ln(rate_react)
sum log_rate_react, detail
histogram log_rate_react
*** frequency ->Count -> proportion
tabulate image catq if catq==4
by image catq, sort: generate freq = _N
by image , sort: generate count = _N
gen prop = freq/count
gen log_prop_rate_react = ln(prop*(rating/reactions))
graph dot (mean) prop if prop > 0.75, over(image, sort(1)) exclude0 title("Top Volunteer Stimuli by Proportion",
span) legend(off) subtitle(" ") note("note goes here", span)
graph export "output\image_top_prop.png", as(png) replace
graph dot (mean) rate_react if (prop > 0.75 & vol_yes==1), over(image, sort(1)) exclude0 title("Top Volunteer
Stimuli by Rating/Reaction Time", span) legend(off) subtitle(" ") note("For images with Proportions of
Volunteering as Category >75%," "and Ratings and Reaction times for only those observations where" "the
Volunteering category was selected.", span)
graph export "output\image_top_rate_react.png", as(png) replace
**** check to see if a lower proportion of US and UK
graph dot (mean) rating if(used==1 & gcountryq ==223 | gcountryq ==224 & prop >0.75 & vol_yes==1), over
(image) by(gcountryq, title("Top Volunteer Stimuli by Rating and Country", span))
graph export "output\image_top_rating_by_country.png", as(png) replace
log close
```

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Appendix H: Exploratory Analysis

This is a rich data set full of interesting insights. The sections below are a few interesting highlights.

Age, Gender, and Regional Differences on Implicit Evaluations

There were no hypotheses about differences by age group, gender, country/region, but many sources suggest that the experience of unemployment and choice to volunteer are influenced by these factors. The box plot shown below illustrates the differences on implicit evaluations (SC-IATD) of volunteering grouped by these

factors.

For example, treatment effects seemed to be more visible in North Americans aged 25-30 in males and females, this did not carry into the UK and European countries for this same age range but did show up to a lesser degree for UK and European pps. aged 31-40.

Looking at SC-IATD by age range in the US (n=118) and UK (n=139), we can see a clearer picture of treatment effects by age range, although caution should be taken as the observation count declines with age.

Q-GOR Age Range	Q-GOR Control or Treatment	
	Control	Treat
18-24	32	24
25-30	13	11
31-40	12	11
41-50	3	4
51-60	4	4

SCIATD US by Age Range

Q-GOR Age Range	Q-GOR Control or Treatment	
	Control	Treatment
18-24	43	45
25-30	8	14
31-40	5	11
41-50	5	4
51-60	5	4

SCIATD UK by Age Range

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Significant Reverse Effects in One Subgroup

US participants that have been unemployed for less than 60 months (n=103) do show a statistically significant reverse effect of the treatment.

The average SC-IAT D score for the n=57 in the control group was M=0.231(SD=0.049), compared to M=0.098(SD=0.250) for the n=46 in the treatment group

```
. ttest sc_iat_d if gor_simple_country_q==18 & gor_unemploy_mnths <60, by(treat)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
Control	57	.2312454	.0491468	.3710505	.1327925	.3296984
Treat	46	.0981031	.0369223	.2504192	.0237377	.1724684
combined	103	.1717838	.032333	.3281439	.1076515	.2359161
diff		.1331424	.0640023		.006179	.2601058

```
diff = mean(Control) - mean(Treat)          t = 2.0803
Ho: diff = 0                                degrees of freedom = 101
```

```
Ha: diff < 0                                Ha: diff != 0                                Ha: diff > 0
Pr(T < t) = 0.9800                          Pr(|T| > |t|) = 0.0400                          Pr(T > t) = 0.0200
```

The difference in means was 0.133(SE=0.064), and is statistically significant using a two-tailed test [t(101)=2.08,p=0.04]<(p=0.05). Therefore, we can reject the null hypothesis that the AAT Treatment had no effect on implicit attitudes toward volunteering, as measured by SC-IATD.

Interaction Effects - Treatment Group##Country

As the table below indicates, the low number of observations outside of the US and UK makes it difficult to come up with any conclusions about treatment effects in those countries. The follow page shows marginsplots indicating the interaction effects of being in the treatment group and from a specific country (only for those with >10 observations) on the indicated dependent variable.

```
. table gor_simple_country_q treat
```

Q-GOR Simple Country of Residence	Q-GOR Control or Treatment	
	Control	Treat
AU - Australia	2	8
AT - Austria	1	1
BE - Belgium	4	
CA - Canada	11	11
DK - Denmark	2	
FI - Finland	3	2
FR - France	2	6
DE - Germany	5	5
HK - Hong Kong	1	
IE - Ireland	1	3
IT - Italy	10	9
NL - Netherlands	3	3
NZ - New Zealand	1	
ES - Spain	9	9
SE - Sweden		2
GB - United Kingdom	61	78
US - United States	64	54

This provides further support of opposing effects by country. Of particular interest is when the US and UK are moving in the opposite directions, like with the SC-IATD.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

Interaction Effects: Being in Treatment Group by Country on SC-IATD

Interaction Effects: Being in Treatment Group by Country on Explicit Feelings Toward Volunteering (EFTV)

Interaction Effects: Being in Treatment Group by Country on Explicit Intent to Volunteer (EI2V)

Interaction Effects: Being in Treatment Group by Country on Explicit Long-Term Intent to Volunteer (LTI2V)

Interaction Effects: Being in Treatment Group by Country on Behavioural Click-through (BeCT) task

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

SC-IATD Block Randomization Order

As discussed in the main body of this report, SC-IATD block randomization may have impacted SC-IATD scores. Greenwald et al. (2003) recommend randomizing block order for the IAT, whereas Karpinski & Steinman (2006) recommend against it for the SC-IAT. The procedures for this study followed the former and randomized block order.

A linear fit of Reaction Time (ms) versus Trial Order, grouped by Block Randomization Order shows that reaction time rate of change increases when a Block is presented first, regardless of whether it is Image + Good or Image + Bad construct. This provides some insight into what Karpinski and Steinman may have been looking at when

recommending against this. With a smaller number of Blocks in the procedure, there are fewer trials to average out the impact of this difference.

SC-IATD is calculated averaging difference in response time between Block 5 and Block 3, and the Block order clearly matters.

Here, the same data is presented showing Block 3 and Block 5 together, grouped by Block order. Suggesting that it

may be beneficial to review the Block-order in relation to SC-IATD calculation. i.e. is it more beneficial to subtract differences by trial order, and not observation when looking for average effects, versus an individual's average implicit evaluation of a concept.

ACTIVATING UNEMPLOYED JOB SEEKERS TOWARD VOLUNTEERING

The image below shows there are some interaction effects on reaction time by treatment condition and randomization order that could have impacted the SC-IATD score.

Reaction time is not normally distributed, so it is not appropriate to use the t-test and look at difference in means.

Mann Whitney tests show that there is a statistically significant difference in Reaction time, in both Block 3 and Block 5, depending on the stage that it is presented.

```
. ranksum react_ms if ( blk3_1==1 | blk3_2==1) , by( blk_stage )
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

blk_stage	obs	rank sum	expected
BL3_1	13988	2.012e+08	1.963e+08
BL3_2	14075	1.925e+08	1.975e+08
combined	28063	3.938e+08	3.938e+08

```
unadjusted variance  4.604e+11
adjustment for ties  -30395.166
adjusted variance    4.604e+11
```

```
Ho: react_ms(blk_st~e==BL3_1) = react_ms(blk_st~e==BL3_2)
z = 7.301
Prob > |z| = 0.0000
```

```
. ranksum react_ms if ( blk5_1==1 | blk5_2==1), by(blk_stage )
```

Two-sample Wilcoxon rank-sum (Mann-Whitney) test

blk_stage	obs	rank sum	expected
BL5_1	14081	1.968e+08	1.993e+08
BL5_2	14221	2.037e+08	2.012e+08
combined	28302	4.005e+08	4.005e+08

```
unadjusted variance  4.723e+11
adjustment for ties  -25142.273
adjusted variance    4.723e+11
```

```
Ho: react_ms(blk_st~e==BL5_1) = react_ms(blk_st~e==BL5_2)
z = -3.542
Prob > |z| = 0.0004
```