

# Expanding the COVID-Dynamic Study to Examine Patterns and Correlates of Substance Use During the Coronavirus Pandemic

## Abstract / Overview

As we face the immediate and longer-term impacts of the coronavirus pandemic, we see two broad domains that confer risk for the development of substance use problems/disorders, one involving medically related adverse impacts due to traumatic stress exposure and loss, and the second involving economic losses and social strains. In both of these domains, substance use, acting as a self-medication, will lead for some to problematic use and disorders. The present study seeks to explore the longitudinal impacts of coronavirus related factors (stressors and trauma, losses, illnesses, economic conditions) on substance use patterns in a national sample, collaborating with the [COVID Dynamic Study \(CDS\) at Caltech](#) led by an interdisciplinary and cross-institution team of social scientists whose overarching translational goal is to help to improve messaging and compliance to public health regulations related to the coronavirus through a better understanding of the socio-emotional factors that influence people's decision-making.

By bringing [Rutgers Center of Alcohol & Substance Use \(CAS\)](#) expertise on alcohol and drug epidemiology, risk, prevention, treatment and big data analytics to the project, we create an opportunity to study important relationships between substance use, traumatic stress, and social decision-making in this national sample, using innovative statistical modeling to detect real-time changes as our participants live through this unprecedented time. With five months of data collection, and one month of data analysis, we will generate rates and patterns of substance use, as well as correlates of use from the rich social data (Twitter, news outlets) that is being collected. Key deliverables will include a summary report which will result in at least three jointly authored publications, and will build an infrastructure that can sustain further interdisciplinary research partnerships between the Rutgers CAS, Caltech and other institutions, including preparation of new intervention grants consistent with NIH PAs from [NIDA](#) and [NIAAA](#).

## II. Significance and Social Impact

Prior to the coronavirus pandemic, the US has been in the midst of fighting a national opioid epidemic and crisis, the drivers of which involved economic, social and emotional factors linked to "deaths of despair." (e.g., Volkow, 2020; Woolf & Shoomaker, 2019). Rising rates of adolescent and emerging adulthood nicotine and cannabis vaping related harms in the context of national changes around cannabis legalization are also increasingly in our awareness (e.g., Patel & Quintero, 2019). Alcohol is still a prominent health risk factor and leading cause of death worldwide (GBD Collaborators, 2016). As the world struggles to reorganize around fighting the coronavirus and adjust to fluid expectations of social distancing, we can expect that there will be rising problematic substance use of all kinds, yet heretofore we know little of how the pandemic has impacted substance use and misuse in the United States.

Increases in substance use in relation to stress and trauma exposure have been well documented (e.g., NIDA, 2001) whether by ongoing conflicts such as war and combat (e.g., post OIF/OEF) or by discrete disasters (e.g., Oklahoma bombing, Boston Marathon, 911). Immediately after the 911 attacks, the New York Academy of Medicine (Vlahov et al., 2004) conducted a representative sampling geo-coded for proximity to the World Trade Center examining mental health and substance use impacts of exposure to trauma, finding high rates for first responders and those in closest proximity to the towers. Findings such as these have been replicated worldwide.

As we face the immediate and longer-term impacts of the coronavirus, we see two broad domains that confer risk for the development of substance use problems/disorders (Gold, 2020). The first involves the medical impacts of the virus where either individuals, family members, frontline healthcare and/or other essential workers are exposed to traumatic losses in the form of death or other traumas associated to the covid-19 infections. The second involves the socio-economic impacts of the virus and stay-at-home orders bringing strains on individuals and families secondary to job and income losses, increased child care responsibilities and other stressors. In both of these domains, substance use, acting as a self-medication, will lead for some to problematic use and disorders.

The present study seeks to capitalize on an opportunity to conduct longitudinal study of the impacts of the coronavirus pandemic on substance use patterns in the US and its relationship to other social and emotional factors including traumatic stress by expanding the COVID Dynamic Study (see below). We will

explore impact of coronavirus related factors (traumatic stressors, losses, illnesses, economic conditions) on substance use patterns across nicotine, alcohol, cannabis and all other drug classes.

The COVID Dynamic Study, “Characterizing the dynamics of emotional and social attitudes during the covid-19 pandemic” (CDS) is a big-data-driven longitudinal survey study of 1,800 individuals from the Prolific.co platform employing survey response and experimental tasks. Its overarching translational goal is to help to improve messaging and compliance to public health regulations related to covid-19 through a better understanding of the socio-emotional factors that influence people’s decision-making. To quantify longitudinal effects that could inform public health policy, they are collecting anonymized data on subjects’ implicit and explicit socio-emotional biases, to characterize how these might relate to social, economic, moral and political judgments. It was launched on April 5, 2020 in nimble response to the coronavirus. It is housed within the [Caltech Conte Center for Social Decision Making](#) whose broad aims are to understand individual differences in how humans make decisions in social settings.

### **III. Key Personnel**

This project represents an interdisciplinary collaboration across 5 institutions (Caltech (Ralph Adolphs, Lynn Paul; Adelphi University (Damian Stanley); The City College of New York (Teresa Lopez-Castro) Chapman University (Uri Maoz); and Yale University (Gideon Yaffe), bringing together a team of social scientists with expertise in neuroscience, implicit biases, decision-making, moral reasoning, clinical and social psychology, and political science. The current proposal will represent a **new** collaboration with the CDS team that will synergize Rutgers CAS expertise on alcohol and drug epidemiology, risk, prevention, treatment and big data analytics to focus on new questions involving substance use patterns and associations with other key socio-emotional variables. The PI, Dr. Denise Hien, Rutgers CAS Director, has a nearly thirty-year career using single site and multi-site trials and translational experimental to clinical studies to study traumatic stress and its relationship to substance use disorders and other important factors that identify individual differences in substance use treatment outcomes. Dr. Lee, a lifespan developmentalist with interest in naturally-occurring mechanisms of desistance from substance use disorders, brings expertise that will facilitate our analysis of the coronavirus impacts through the lens of how shifting contexts, routines, and responsibilities can alter expression of addiction susceptibility. Dr. Zhao, a Biostatistician with extensive experience in analyzing intensive longitudinal data and in pattern discovery, will provide statistical support and be responsible for data analysis aspect of this project. Lorraine Y. Howard, a PhD student at Rutgers School of Social Work and Director of Rutgers CAS Addiction Education with over twenty years clinical experience working with individuals and families with substance use disorders, will provide prevention/intervention guidance.

### **IV. Innovation and Strategic Advantage(s)**

Capitalizing upon the quick start-up of the large, recently deployed longitudinal study (CDS), our project adds an important area of new study that will allow for: 1) timeliness and economies of scale along with enhancing both the CDS existing data collection and variables, and 2) expanding the COVID-Dynamic study to include substance use patterns and their impacts which are crucial for informing public policy on decision making of all kinds during this time. The ongoing data collection on a number of variables (including experimental tasks) will greatly enhance the relevance beyond our understanding of the trajectory of substance use patterns during the evolving pandemic and social changes in relation to it (i.e., social distancing, return to work, etc.). Using the Prolific.co platform and [OSPHome](#) enables us to participate in an OpenScience project facilitating data sharing. Although some members of the COVID-Dynamic team have worked with Dr. Hien in the past (Lopez-Castro, Stanley), creating this new partnership for social neuroscience research across institutions will broaden opportunities for new collaborations with the two junior colleagues at Rutgers CAS.

### **V. Extramural Funding Plan**

There are at least two important lines of future funding that may be generated with pilot findings from the current study. The first involves an existing line of translational research (PI with collaborators Lopez-Castro and Stanley) (see [TREATlab](#)) that brings novel approaches in social and affective neuroscience to study individual differences in trauma-exposed and substance using individuals in order to develop better prevention/intervention models to target both of these conditions. The National Institute on Drug Abuse

Behavior Therapies Development Branch e.g., <https://grants.nih.gov/grants/guide/pa-files/par-19-212.html> and the National Institute of Alcohol Abuse and Alcoholism <https://grants.nih.gov/grants/guide/pa-files/PA-16-072.html> has standing treatment development programs that aim to examine individual difference in treatment outcomes and are highly responsive to translational studies which take human experimental findings to provide novel directions for treatment development. Therefore, R01 funding streams are available for a project that could emerge from this new collaboration. The second involves a covid-19-specific line that would serve to develop an internet-based prevention/intervention strategy for individuals whose use patterns show increases into a misuse/disorder level of risk. NIAAA and NIDA both support intervention development and study. We expect that covid-19 funding opportunities in this area will arise in the near future, and as a result of collecting these preliminary data, we will be well-positioned to compete for such funding.

## VI. Research Strategy

a. **Rationale.** In order to characterize the nature and impact of the social, emotional and traumatic stress factors on substance use and misuse during the time of the coronavirus, the present study's longitudinal trajectory model will examine substance use and misuse patterns in U.S. sample of 1800 participants from across 50 states who have been participating in a social decision-making study to inform public health policy.

b. **Approach.** Subject recruitment and testing began on April 5, 2020, with additional waves of retesting every one to two weeks for the first month and then monthly to continue for at least one year. Data from three waves has been analyzed for quality control and instrument design purposes, but has not been analyzed for any hypothesis testing. The data have been preregistered at OSFhome, a public research site, following an [OPEN SCIENCE paradigm](#), including methods of participant recruitment, sample size, inclusion and exclusion criteria, and general study procedures. Subsequent preregistrations will provide updates and cover specific studies that are being conducted using the data collected with the procedures described here.

Participants for the battery of surveys and tasks are recruited using [Prolific.co](#), an online platform that connects researchers to participants. Prolific.co maintains a large panel of potential study participants for research projects. Researchers develop questionnaire and tasks, and then use Prolific.co to define the potential sample of participants for the study. The study instrument is made available to the selected Prolific.co participants, who are compensated for their time and effort at the completion of each wave of our study. A number of studies have examined the use of Prolific.co for academic research projects and importantly have found that Prolific.co participants and data quality compare favorably or are superior to other online data collection platforms (e.g., Palan and Schitter, 2018; Peer, Brandimarte, Samat, and Acquisti, 2017). Following recruitment via Prolific.co, data collection is implemented via Qualtrics.com (surveys) and Pavlov.org (a platform for hosting online psychological tasks). All tasks were developed in house using the JsPsych javascript library (de Leeuw, JR, 2015)

The CDS test battery includes self-report measures of personal background and coronavirus-focused issues, applying 2 publicly-available covid-19-specific instruments, multiple published psychological assessment instruments, and several experimental questionnaires. The covid-19-specific self-report questionnaires (see Table 1) query fear and disgust regarding potential virus exposure, details about individual experiences of pandemic-related restrictions, personal concerns, theories of coronavirus origin, expectations about how coronavirus may differentially impact various groups, and beliefs and opinions related to social norms. Personal background questions address: self-care, state of residence, size of residential location, counseling and mental health status, employment and volunteer activities, relationship status, weekly income, receipt of federal and local assistance, top three stressors in life, voting behaviors, political ideology, and religious practices. Two published / publicly available covid-19-specific instruments: [The Epidemic-Pandemic Impacts Inventory](#) and [Social Psychological Survey of COVID-19](#) (Government Response, city, state & federal versions) are being used to assess COVID-19-specific topics. The battery of published psychological instruments assess personality traits, social and emotional support networks, implicit and explicit racial bias, history of traumatic stress, current mood and affect, and beliefs about free will, authority, and social values.

Experimental Measures: Individuals' beliefs, preferences, and predictions regarding social, health, and policy/economic topics related to covid-19 are assessed on a biweekly/monthly basis. See Table 1 for a complete list of experimental measures and tasks which assess a range of social decision-making and control tasks including coronavirus vignettes, general responsibility vignettes, emotional space, several implicit association tasks that focus on prosocial and multiracial misattributions, and several altruism tasks. The current administration takes one hour to complete.

For the proposed collaboration, we will add new measures to evaluate substance use patterns that will allow us to examine lifetime use patterns, as well as the model trajectories of use over the time period of 5 months. We will adapt the [Alcohol, Smoking and Substance Involvement Screening Test \(ASSIST\)](#) which was developed for the World Health Organization (WHO) by an international group of substance abuse researchers to detect and manage substance use and related problems in primary and general medical care settings. The measure will allow us to assess past year (prior to covid-19) baseline use patterns, as well as to longitudinally assess current use at each subsequent assessment where the timeframe of analysis will be use since last assessment. Substance frequency and quantity will be assessed. For those with significant use, additional questions regarding substance-related consequences will also be completed, determining level of risk (low, moderate, high). We note that self-reported substance use has been shown to correspond well with urine toxicology, when self-reports are elicited in research contexts where negative consequences will not ensue from acknowledging drug use (Clark et al., 2016; Wilcox et al., 2013). Adding this measure should increase the administration by 5-10 minutes.

c. **Expected outcomes:** The aims of the present longitudinal trajectories approach are three fold: 1. To characterize patterns of substance use of licit (tobacco smoking and vaping, alcohol, cannabis (in some states) and illicit substances (stimulants, opioids, etc.) over the course of time as the coronavirus pandemic and its social impacts evolve. 2. To examine relationships between covid-19 specific traumatic stressors of all kinds and related substance use patterns using latent class analysis to model trajectories of substance use by levels of trauma exposure, and time varying effects and cross lagged panel models to examine time based changes in both sets of variables (e.g. trauma and substance use) (e.g., Hien, Jiang, Campbell et al., 2010; Hien, Zumberg, Owens et al., 2018; Lopez-Castro et al., 2015). 3. To examine relationships between other social and emotional variables (e.g., mood changes, social decision-making, implicit biases) and substance use over the course of the coronavirus pandemic. We will be able to identify covid-19 diagnosis (confirmed, suspected, no) as a key predictor in these analyses. We will also examine differences between East and West coast participants across all domains of interest.

The findings will expand our knowledge of substance use and stress in several ways. First, we will quantify substance use patterns and behavior in response to a real-world event. Second, we will be able to examine important, evolving relationships between stressful life events/traumatic stress and substance use in response to the pandemic. Third, we will be able to examine important social and emotional constructs that affect public health decision making as they are influenced by substance use practices during the pandemic.

Additional outcomes: 1. A summary report will result in at least three jointly authored publications, including recommendations for further intervention development. 2. The project will take initial steps to build an infrastructure that can sustain further interdisciplinary clinical research partnerships in the Rutgers consortium. 3. Consistent with National Institute of Health PAs (see above), following from the proposed study, we plan to develop an application that will develop and test a web-based trauma-informed intervention that targets risk factors and stressors for substance use. This type of intervention is also of interest to NIDA R34/SBIR and NIH PCORI mechanisms. The CDS executive board will make recommendations regarding which type of application to pursue as a first grant application, with an expected submission date for the Feb or June 2021 grant cycles.

d. **Timeline.** Study assessments will be added to existing data collection by two weeks post funding, using an amendment to the existing IRB. Assessments will occur monthly for five months. In month six, data will be analyzed following our analytic plan (above) in order to prepare a final report/publication and to be used for presentation and future grant preparation.

	<b>Phase 1</b>	<b>Phase 2</b>	<b>Phase 3</b>
Calendar Months	June 1 2020-June 15 2020	June 15 2020-Nov 15 2020	Nov 15-2020-Jan 2021
Project Aims	<ul style="list-style-type: none"> <li>• Submit IRB amendment to Caltech and IRB to Rutgers for expedited review</li> <li>• Finalize assessment measures for inclusion in study survey battery</li> </ul>	Conduct monthly data collection	<ul style="list-style-type: none"> <li>• Data Analysis and interpretation</li> <li>• Manuscript development</li> <li>• Grant application preparation (Feb-June Cycles)</li> </ul>

## e. References

- Clark, C.B., Zyambo, C.M., Li, Y., Cropsey, K.L., 2016. The impact of non-concordant self-report of substance use in clinical trials research. *Addict. Behav.* 58, 74–79
- de Leeuw, J.R. (2015). jsPsych: A JavaScript library for creating behavioral experiments in a web browser. *Behavior Research Methods*, 47(1), 1-12. <https://doi.org/10.3758/s13428-014-0458-y>.
- GBD 2016 Alcohol Collaborators (2016). Alcohol use and burden for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *Lancet*, 392 (10152), pp.1015-1035.
- Gold M. S. (2020). The Role of Alcohol, Drugs, and Deaths of Despair in the U.S.'s Falling Life Expectancy. *Missouri medicine*, 117(2), 99–101.
- Hien, DA, Jiang, H., Campbell, A., Hu, M., Miele, GM, Cohen, LR, Brigham, G., ^Capstick, C., Kulaga, A., Robinson, J., Suarez-Morales, L., & Nunes, EV. (2010). Do treatment improvements in PTSD severity affect substance use outcomes? A secondary analysis from a randomized clinical trial in NIDA's Clinical Trials Network, *American Journal of Psychiatry*, 167(1), 95-101. (doi:10.1176/appi.ajp.2009.09091261)
- Hien, DA, Zumberg, K., Owens, M, Lopez-Castro, T, Ruglass, L, & ^Papini, S. (2018). Lagged effects of symptom change in a randomized controlled trial for PTSD and substance use disorders with modified prolonged exposure and relapse prevention. *Journal of Consulting and Clinical Psychology*, 86 (10), 810-819, doi.org/10.1037/ccp0000345. NIHMS 984048, PMID [30265040](https://pubmed.ncbi.nlm.nih.gov/30265040/).
- Lopez-Castro, T., Hu, M. C., Papini, S., Ruglass, L. M., & Hien, DA. (2015). Pathways to change: Trajectories following treatment in women with co-occurring PTSD and substance use disorders. *Drug and Alcohol Dependence*. 146:e185. (doi:10.1016/j.drugalcdep.2014.09.418)
- Palan, S., & Schitter, C. (2018). Prolific. ac—A subject pool for online experiments. *Journal of Behavioral and Experimental Finance*, 17, 22-27.
- NIDA. (2001, November 1). Stress and Substance Abuse: A Special Report After the 9/11 Terrorist Attacks. Retrieved from <https://archives.drugabuse.gov/publications/stress-substance-abuse-special-report-after-911-terrorist-attacks> on 2020, May 4
- Patel, N. & Quinetero, D. The youth vaping epidemic: Addressing the rise of e-cigarettes in schools. Brookings Institute Report, Brown Center Chalkboard, Nov, 22, 2019. <https://www.brookings.edu/blog/brown-center-chalkboard/2019/11/22/the-youth-vaping-epidemic-addressing-the-rise-of-e-cigarettes-in-schools/>
- Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology*, 70, 153-163.
- Vlahov, D. Galea, S., Ahern, J., Resnick, H., Boscarino, J.A., Gold, J., Bucuvalas, M., & Kilpatrick, D. (2004) Consumption of Cigarettes, Alcohol, and Marijuana Among New York City Residents Six Months After the September 11 Terrorist Attacks, *The American Journal of Drug and Alcohol Abuse*, 30:2, 385-407, DOI: 10.1081/ ADA-120037384
- Volkow ND. Collision of the COVID-19 and Addiction Epidemics. *Ann Intern Med*. 2020; [Epub ahead of print 2 April 2020]. doi: <https://doi.org/10.7326/M20-1212>

Wilcox, C.E., Bogenschutz, M.P., Nakazawa, M., Woody, G., 2013. Concordance between self-report and urine drug screen data in adolescent opioid dependent clinical trial participants. *Addict. Behav.* 38, 2568–2574.

Woolf, S.H., Schoemaker, H. (2019). Life Expectancy and Mortality Rates in the United States, 1959-2017. *JAMA* 322(20), 1996-2016. doi: 10.1001/jama.2019.16932. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/31769830>

## f. Supplementary Tables and Figures

**Table 1. COVID-DYNAMIC TEST BATTERY**

	<b>Administration* (where designation is weekly for first waves then monthly)</b>
<b>COVID-DYNAMIC original self-report questionnaires</b>	
Personal background - intake	Intake
Personal background - weekly update	Weekly*
Personal background - monthly update	Monthly
COVID Disgust	Weekly*
COVID Explicit Norms	Weekly*
COVID Fear	Weekly*
COVID Real World Experiences	Weekly*
COVID Theories	Weekly*
Race Thermometer	Weekly*
Restriction Severity	Occasional
<b>Published / publicly available COVID-specific instruments</b>	
Epidemic – Pandemic Impacts Inventory (EPII) [1]	Weekly*
Scales from the Social Psychological Measurements of COVID-19 (Conway, Woodard, & Zubrod) [2]	Bi-weekly*
<b>Published Psychological Instruments</b>	
The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST) [3]	Monthly
Beck Depression Inventory - II (BDI-II) [4]	Bi-weekly*
Disgust Scale - Revised (DS-R) [5-7]	Bi-weekly*
Internal Motivation to Respond Without Prejudice Scale (IMS); External Motivation to Respond Without Prejudice Scale (EMS): Black & Chinese versions [8]	Bi-weekly*
Free Will Inventory [9]	Occasional
Humanitarianism-Egalitarianism [10]	Bi-weekly*
Life Events Checklist (LEC) [11] & PTSD Checklist-5 [12]	Intake
NEO-FFI [13]	Intake & 6 months
NIH toolbox: Emotional Support, Loneliness [14]	Weekly*
Positive and Negative Affect Scales (PANAS) [15-16]	Weekly*

Primary Care-PTSD Screen (PC-PTSD) [17]	Bi-weekly*
Perceived Stress Scale (PSS) [18-19]	Weekly*
SNI_Extended (2019 at intake) [20]	Monthly
STAI-State (STAI-Trait, bi-monthly) [21]	Weekly*
Very Short Authoritarianism Scale (VSA) [22]	Bi-weekly*
<b>Experimental Measures</b>	
Emotion Space	Weekly*
Consensus Task	Bi-weekly*
Responsibility Vignettes	Weekly*
COVID Vignettes	Weekly*

### Questionnaire Bibliography

- [1] Grasso, D.J., Briggs-Gowan, M.J., Ford, J.D., & Carter, A.S. (2020). **The Epidemic – Pandemic Impacts Inventory (EPII)**.
- [2] Conway, L. G., III, Woodard, S. R., Zubrod, A. (2020, April 7). **Social Psychological Measurements of COVID-19: Coronavirus Perceived Threat, Government Response, Impacts, and Experiences Questionnaires**. <https://doi.org/10.31234/osf.io/z2x9a>
- [3] World Health Organization. **The Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)** [https://www.who.int/substance\\_abuse/publications/assist/en/](https://www.who.int/substance_abuse/publications/assist/en/)
- [4] Beck, A.T., R.A. Steer, Brown, G.K. (1996). **Manual for the Beck Depression Inventory-II**. San Antonio, TX: Psychological Corporation.
- [5] Haidt, J., McCauley, C., Rozin, P. (1994). **Individual differences in sensitivity to disgust: A scale sampling seven domains of disgust elicitors** Personality and Individual Differences 16(5), 701-713. [https://dx.doi.org/10.1016/0191-8869\(94\)90212-7](https://dx.doi.org/10.1016/0191-8869(94)90212-7)
- [6] Haidt, J., McCauley, C., Rozin, P. (2002). **The Disgust Scale, Version 2**. Available from: <http://www.people.virginia.edu/~jdh6n/disgustscale.html>.
- [7] Olatunji, B., Williams, N., Tolin, D., Abramowitz, J., Sawchuk, C., Lohr, J., Elwood, L. (2007). **The Disgust Scale: Item analysis, factor structure, and suggestions for refinement**. Psychological Assessment 19(3), 281-297. <https://dx.doi.org/10.1037/1040-3590.19.3.281>
- [8] Plant, E., Devine, P. (1998). **Internal and external motivation to respond without prejudice**. Journal of Personality and Social Psychology 75(3), 811-832. <https://dx.doi.org/10.1037//0022-3514.75.3.811>
- [9] Nadelhoffer, T., Shepard, J., Nahmias, E., Sripada, C., Ross, L. (2014). **The free will inventory: Measuring beliefs about agency and responsibility**. Consciousness and Cognition 25(), 27-41. <https://dx.doi.org/10.1016/j.concog.2014.01.006>
- [10] Katz, I., Hass, R. (1988). **Racial ambivalence and American value conflict: Correlational and priming studies of dual cognitive structures**. Journal of Personality and Social Psychology 55(6), 893-905. <https://dx.doi.org/10.1037/0022-3514.55.6.893>
- [11] Weathers, F. W., Blake, D. D., Schnurr, P. P., Kaloupek, D. G., Marx, B. P., Keane, T. M. (2013). **The Life Events Checklist for DSM-5 (LEC-5) – Standard**.
- [12] Weathers, F. W., Litz, B. T., Keane, T. M., Palmieri, P. A., Marx, B. P., Schnurr, P. P. (2013). **The PTSD Checklist for DSM-5 (PCL-5) – LEC-5 and Extended Criterion A**.
- [13] Costa, P. T., & McCrae, R. R. (1989). **The NEO-PI/NEO-FFI manual supplement**. Odessa, FL.: Psychological Assessment Resources.

- [14] Gershon, R., Wagster, M., Hendrie, H., Fox, N., Cook, K., Nowinski, C. (2013). **NIH Toolbox for Assessment of Neurological and Behavioral Function** *Neurology* 80(Issue 11, Supplement 3), S2-S6. <https://dx.doi.org/10.1212/wnl.0b013e3182872e5f>
- [15] Watson, D., L.A. Clark, Carey, G. (1988). **Positive and negative affectivity and their relation to anxiety and depressive disorders.** *J Abnorm Psychol*, 97(3): p. 346-53.
- [16] Crawford, J., Garthwaite, P., Lawrie, C., Henry, J., MacDonald, M., Sutherland, J., Sinha, P. (2009). **A convenient method of obtaining percentile norms and accompanying interval estimates for self-report mood scales (DASS, DASS-21, HADS, PANAS, and SAD)** *British Journal of Clinical Psychology* 48. <https://dx.doi.org/10.1348/014466508X377757>
- [17] Prins, A., Bovin, M., Smolenski, D., Marx, B., Kimerling, R., Jenkins-Guarnieri, M., Kaloupek, D., Schnurr, P., Kaiser, A., Leyva, Y., Tiet, Q. (2016). **The Primary Care PTSD Screen for DSM-5 (PC-PTSD-5): Development and Evaluation Within a Veteran Primary Care Sample.** *Journal of general internal medicine* 31(10), 1206-11. <https://dx.doi.org/10.1007/s11606-016-3703-5>
- [18] Cohen, S., Kamarck, T., Mermelstein, R. (1983). **A Global Measure of Perceived Stress** *Journal of Health and Social Behavior* 24(4), 385. <https://dx.doi.org/10.2307/2136404>
- [19] Cohen, S., Williamson, G. (1988). **Perceived Stress in a Probability Sample of the United States**, in *The Social Psychology of Health*, S. Spacapan and S. Oskamp, Editors. Sage: Newbury Park, CA.
- [20] Cohen, S., Doyle, W., Skoner, D., Rabin, B., Gwaltney, J. (1997). **Social Ties and Susceptibility to the Common Cold** *JAMA: The Journal of the American Medical Association* 277(24), 1940. <https://dx.doi.org/10.1001/jama.1997.03540480040036>
- [21] Spielberger, C.D., et al., (1983). **Manual for the State-Trait Anxiety Inventory.** Palo Alto, CA: Consulting Psychologists Press, Inc.
- [22] Bizumic, B., Duckitt, J. (2018). **Investigating right wing authoritarianism with a very short authoritarianism scale** *Journal of Social and Political Psychology* 6(1), 129-150. <https://dx.doi.org/10.5964/j spp.v6i1.835>

## VII. Curriculum Vitae

### Rutgers CAS

Denise Hien, Ph.D, ABPP, Clinical Psychology, Addictions (PI)  
 Matthew Lee, Ph.D., Clinical Psychology, Alcohol Research  
 Yihong Zhao Ph.D., Biostatistics  
 Lorraine Y. Howard, M.S.W., Ph.D. Candidate, Social Work

### Caltech

Ralph Adolphs, Ph.D., Neurobiology, Neuropsychology  
 Lynn Paul, Ph.D., Clinical Neurobiology

### Adelphi University

Damian Stanley, Ph.D., Cognitive Neuroscience, Social Affective and Computational Neuroscience

### Chapman University

Uri M. Maoz, Ph.D., Computational Neuroscience

### City College of New York

Teresa Lopez-Castro, Ph.D., Clinical Psychology

### Yale University

Gideon Yaffe, Ph.D., Philosophy