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Construction of the Social Distance Scale and the Relationship Between Trait Empathy and Social Distancing

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CONSTRUCTION OF THE SOCIAL DISTANCE SCALE AND THE RELATIONSHIP
BETWEEN TRAIT EMPATHY AND SOCIAL DISTANCING

by

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ABSTRACT

This paper describes the development of a brief self-report screening measure of adherence to social distancing and self-protective behaviors in pandemic situations. It provides initial statistical evaluations of correlations between social distancing behaviors and two trait measures (social desirability and trait empathy). Items measures were designed to quantify behaviors recommended by the CDC as primary strategies to prevent and reduce the spread of the COVID-19 infection. An item pool of 29 questions was generated with the aim of estimating the frequency of specific behaviors and were written to avoid confounding the description of behavioral actions with evaluative judgements. Responses were collected from 401 young adults using an anonymous online survey. An Exploratory Factor Analysis was conducted with the purpose of item reduction and subscale development. A 14-item Social Distance Scale (SDS) emerged, consisting of 4-subscales: Isolation from Community (IC), Work from Home (WH), Family Contact (FC), and Protective Behaviors (PB). The initial psychometric evaluation of the scales indicated adequate internal consistency and test-retest reliability. The Social Distance Scale is a promising new instrument which may be applied at the population or individual level. It may be used in conjunction with COVID-19 testing to measure interactions between social distancing factors and transmission. In addition, a reliable screening measure has utility for health service providers to assess patient risk and to provide education/counseling.

A secondary purpose of this research was to examine the relationship between trait empathy and social distancing. A MANCOVA was performed using the four subscales of the SDS v.1 with Empathy Group and Gender Group as fixed factors and the Socially Desirable Response Set (SDRS-5) as a covariate. The SDRS-5 was found to be a significant covariate for

both the IC and PB subscales of the SDS v.1 , where higher levels of socially desirable responding lead to higher scores on IC and PB. It was hypothesized that participants high in self-reported trait empathy would demonstrate higher levels of social distancing. Indeed it was found that a significant main effect for Empathy Group emerged, where Empathy Group was significantly related to IC, WH, and PB. In line with expectations, participants in the High Empathy Group scored higher on these three dimensions of social distancing than those in the Low Empathy Group. A significant main effect for Gender Group was obtained for PB. Women were found to be significantly more likely to engage in protective behaviors such as hand washing, mask wearing, and maintaining 6 feet of distance than men.

ACKNOWLEDGMENTS

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1: INTRODUCTION

In late 2019 the first cases of a novel coronavirus, which would later go on to be named SARS-coV-2, were detected in the Wuhan region of China (CDC, 2020c). Over one year later COVID-19, the disease that results from infection with SARS-coV-2 (CDC, 2020c), is on track to be one of the most severe pandemics in recent history. Even with limited testing resources, as of this writing, the World Health Organization has already reported over 115,000,000 cases and 2,500,000 deaths due to COVID-19 worldwide (WHO, 2020b). Over 28,000,000 of these cases and 500,000 of these reported deaths are in the United States (CDC, 2020a). According to the American Center for Disease Control, COVID-19 is thought to be primarily contracted person-to-person through the respiratory droplets of both symptomatic and asymptomatic individuals in a similar manner to how the flu is spread (CDC, 2020b). Unlike the flu, however, those infected with COVID-19 go on to infect a greater number of people on average and there is a significantly higher rate of severe range COVID-19 cases among these individuals than is seen among those with influenza (WHO, 2020a).

Currently, treatments for COVID-19 are limited and are largely targeted toward treating symptoms ("Treatments for COVID-19", 2020). Among more severe cases some experimental uses of treatments such as antiviral medications and convalescent plasma transfusions, in which antibody-rich plasma from an individual who has recovered from an infectious disease is transferred to an ill patient, are being used. However, there is currently no accepted consensus as to the effectiveness of such treatments ("Treatments for COVID-19"). Due to this and the highly transmissible nature of COVID-19 it is clear that preventing the spread of the virus is paramount when it comes to preserving public health.

CHAPTER 2: LITERATURE REVIEW

Social Distancing

Most countries impacted by COVID-19 have implemented the practice of social distancing, which the CDC reports to be one of the most effective interventions in inhibiting the spread of the virus (2020d), in response to the rapid spread of the virus SARS-coV-2. The CDC describes social distancing as keeping "at least 6 feet (about 2 arms' length) from other people who are not from your household in both indoor and outdoor spaces" and recommends that this should be paired with protective behaviors such as mask wearing, hand washing, and substituting physical social events with virtual forms of communication.

Research on social distancing prior to the COVID-19 pandemic is somewhat sparse; however, studies of influenza spread, particularly H1N1, do exist and lend credence to the efficacy of social distancing. For example, a narrative synthesis of one dozen modeling studies focused social distancing behaviors in relation to influenza spread "estimated that workplace social distancing measures alone produced a median reduction of 23% in the cumulative influenza attack rate in the general population" (Ahmed, Zviedrite, & Uzicanin, 2018, para. 3). Research performed on archival data from 43 cities during the 1918 influenza pandemic has also revealed that large scale social distancing behaviors such as preventing public gatherings and quarantining the ill were effective in reducing the spread of the Spanish flu (Markel et al., 2007). Specifically, earlier interventions produced lower death rates and lower infection rates, and that author reported "a statistically significant association between increased duration of nonpharmaceutical interventions and a reduced total mortality burden" (Markel et al.).

Much of the research that is now emerging regarding the current pandemic echoes these findings. The implementation of social distancing measures taken by the government in South Korea in February and March of 2020, including advising the public to stay at home and public messaging about personal protective behaviors such as hand washing, showed a significant reduction in healthcare visits due to influenza-like-illness as compared to previous flu seasons where social distancing procedures were not taken (Choe & Lee, 2020). The data that are beginning to emerge from the United States corroborates these findings. One such study that tracked smartphone GPS data in order to ascertain levels of social distancing across the country found that stay at home orders increased the incidence of social distancing behaviors by more than a third and that these increased social distancing behaviors were associated with a "29% reduction in COVID-19 incidence…and a 35% reduction in COVID-19 mortality" (Vopham et al., 2020).

Despite the great value of such interventions there is currently no measure of social distancing and protective behaviors that meets psychometric standards that the authors are aware of. This study endeavors to develop one such measure. This has the potential to be helpful both at the individual and community levels. For example, such a measure could be utilized by researchers in conjunction with COVID-19 testing in order to better ascertain the impact and benefits that social distancing has on transmission, as well as which social distancing behaviors are most protective. Such research could continue on to be applied in the study of the identification of risk-factors among underserved and minority communities that are currently disproportionately affected by the pandemic. Moreover, the ability to quickly and reliably measure social distancing behaviors in a standardized format may present a helpful tool for

healthcare workers when assessing the risk of infection faced by patients, which could then be helpful for designing behavioral interventions for high-risk patients.

Social Desirability

Social desirability refers to a form of response bias where individuals respond in a manner that is concurrent with social ideals, rather than answering in a fully honest fashion (Krumpal, 2011). Social desirability is a recurring variable in social psychology research and has been established to have significant impacts on self-report measures, particularly when they relate to topics where one's culture has prescribed a set of acceptable norms. Specifically, social desirability amplifies reports of positive traits and can suppress reporting of negative traits. Higher levels of social desirability have been connected to a lower inclination to report psychological distress (Deshields, Tait, Gfeller, & Chibnall, 1995), drug use, and risky sexual behavior (Krumpal, 2011). Interestingly, research in the field of business ethics has suggested that the influence of social desirability bias in decision making is greater when individuals are presented with more unethical situations, leading to more ethical responding in the face of progressively more immoral circumstances (Chung & Monroe, 2003).

Due to these factors measures of social desirability are often included in social and behavioral science research in order to assess the impact of socially desirability on survey results. This is of significant importance in relation to social distancing during the current COVID-19 pandemic as many aspects of social distancing, particularly actions such as mask-wearing, have attained strong social and political implications. Therefore, it is possible that socially desirable responding will be present when individuals are questioned about social distancing behaviors.

4

<u>Empathy</u>

In recent decades a significant body of research has accumulated demonstrating a link between empathy and a variety of prosocial behaviors (Eisenberg & Miller, 1987; Bagozzi & Moore, 1994; Paciello et al., 2013). Prosocial behavior can be defined as behaviors which are designed to benefit others rather than oneself (Eisenberg & Miller, 1987). Research has indicated that this relationship may also extend to prosocial health behaviors, such as good hand hygiene practices in hospitals (Sassenrath, Diefenbacher, Siegel, & Keller, 2015) and even individuals' decision to fill out an organ donor card (Cohen & Hoffner, 2012). Measuring prosocial behaviors is of specific import in relation to the current COVID-19 pandemic, as social distancing requires individuals, many of whom may be low risk, to engage in potentially inconvenient physical distancing behaviors to protect society's most vulnerable.

Despite evidence that empathy and certain prosocial health behaviors may be related, the relationship between empathy and social distancing behaviors in this context is less clear. Just over one year after the outbreak of the novel SARS-coV-2 virus in the United States research on the connection between physical distancing behaviors and empathy is not abundant, however some studies are emerging which indicate a link between empathy and social distancing. Recent research on how affective empathy and empathetic messaging impact social distancing has demonstrated a significant positive relationship between empathy and social distancing (Pfattheicher, Nockur, Böhm, Sassenrath, & Petersen, 2020). It was found that empathy has a significant impact on self-reported motivation to adhere to physical distancing guidelines, as well as the amounts of social distancing behaviors actually reported. This study also reported that while "motivation to adhere to physical distancing did not significantly increase in the

information-only condition … the information + empathy condition had a significantly higher mean" (Pfattheicher et al., 2020, p. 5). Notably, the participants in this study were located in Germany, rather than the United States. However, another study that assessed citizens of the United States, Germany, and the United Kingdom reported that there existed "a positive relation between empathy and physical distancing" in all three nations, indicating similarities between these samples. It is of note that the strongest relationship between empathy and social distancing was found in the United States, followed by Germany, and then finally the UK.

While the connection between social distancing and empathy is not conclusive, it stands to reason that further exploring this line of study could serve to aid in the development of effective public health messaging. A unique facet of this study is that rather than measuring direct levels of empathy for other individuals during the COVID-19 pandemic, participants are asked to assess their levels of empathy as a trait using the Single Item Trait Empathy Scale (Konrath, Meier, & Bushman, 2017). This has the potential to explore a new avenue between the relationship of empathy and social distancing behaviors.

<div align="center">Purpose</div>

The first purpose of this study is to generate a reliable and valid scale to measure social distancing behaviors, and to perform preliminary psychometric analyses of this measure. This will establish a psychometrically sound Social Distance Scale and determine if a multi-dimensional structure emerges. The factor structure will be determined using exploratory/inductive techniques.

The secondary purpose of this research is to examine the relationship between trait empathy and social distancing. The hypothesis is that individuals high in self-reported trait empathy will demonstrate higher levels of social distancing than individuals that are low in self-reported trait empathy.

CHAPTER 3: METHODOLOGY

Social Distance Item Pool

The Social Distance Item Pool consists of 29 items designed to measure respondents' level of social distancing behaviors. The Social Distance Item Pool targets multiple areas of social and physical distancing, including: protective behaviors such as mask wearing, frequency of leaving ones' home for purposes such as grocery shopping, physical exposure to small and large groups, work requirements outside of the home, the use of technology for social contact, physical exposure to family members of varying ages, exposure to nursing homes, utilization of public transportation, and attendance of religious and funeral services (see Appendix D). Items are formulated on a 5-point Likert scale scored from 0 to 4, with 0 indicating low levels of social distancing behaviors and 4 indicating high levels of social distancing behaviors. Items ask respondents to rate their social distancing behaviors over the past month by their frequency from "Never" to "Always/Daily". The Social Distance Item pool was used to generate the Social Distance Scale which is described extensively in Study 1.

Single Item Trait Empathy Scale (SITES)

The Single Item Trait Empathy Scale (see Appendix F), or the "SITES", was developed as a quick way to broadly assess levels of empathy in survey participants (Konrath, Meier, & Bushman, 2017). The single item "I am an empathetic person" assesses an individual's level of agreement with this statement. The SITES is scored on a 5-point Likert scale ranging from "Strongly Disagree" to "Strongly Agree". It has demonstrated validity and reliability in psychometric studies (Konrath et al., 2017). The SITES has demonstrated convergent validity

with multiple dimensions of the Interpersonal Reactivity Index, which is one of the most commonly used empathy measures, particularly in the dimensions of "empathic concern $r(3282) = 0.50$, $p < .001$ and perspective taking, $r(3281) = 0.38$, $p < .001$" (Konrath et al., 2017). The SITES has also demonstrated reasonable levels of test-retest reliability $r(344) = 0.57$, $p < .001$ for a single item measure.

Five Item Measure of Socially Desirable Response Set (SDRS-5)

The five-item measure of socially desirable response set or the "SDRS-5" (see appendix G), was developed from a short form of the well-established Marlowe-Crowne scale in order to quickly measure socially desirable responding (Hays, Hayashi, & Stewart, 1989). Items are scored on a 5-point Likert scale, where the most extreme response that indicates socially desirable responding is scored as a "1" and all other responses are scored as a "0" (Hays et al., 1989). The SDRS-5 has yielded acceptable Cronbach's alpha scores of .66 and .68 in two studies and a test-retest score of .75 (Hays et al., 1989).

Participants

Participant data was obtained from undergraduates enrolled in introductory psychology courses at a large university in the southeastern United States. Participants were recruited to partake in ongoing research monitoring social distancing behaviors and personal COVID-19 pandemic impact for course credit. The recruitment flyer is displayed in Appendix A. Introductory psychology is a required course in the general education curriculum for most majors at this university. Therefore, the undergraduate population and all majors were well represented. Eligibility criteria excluded vulnerable populations, required participants to be over the age of

9

18, and able to complete an online questionnaire in the English language. The research study was exempted by the Institutional Review Board at the University of Central Florida. An approval letter confirming this exemption can be found in Appendix C.

The original dataset totaled 579 participants. The n of 579 was cleaned for data analysis and the resulting n was comprised of 401 student data entries. For the purpose of establishing test-retest reliability students responded to the Social Distance Item Pool a second time an average of 7 days after their first exposure. The original dataset for the test-retest portion of this study was comprised of 171 responses. The n of 171 was cleaned for data analysis and the result n was 109. The exploratory analysis (EFA) performed in this research study will be a template for future procedures and statistical analyses on the Social Distance Item Pool.

CHAPTER 4: PROCEDURE

Data was acquired in the summer of 2020 from May 22nd until July 31st. Two participant datasets were acquired; one initial set of responses in which participants responded to the Social Distance Item Pool and a second set of responses recorded an average of 7 days later for the purposes of establishing test-retest reliability. Participants logged into SONA, a cloud-based research software system for universities to ensure course credit is provided. SONA anonymously linked participants to Qualtrics which delivered the online survey measures and stored their responses. Initially, 579 participants completed the first wave of data collection. This dataset was then reviewed for random, inconsistent, and incomplete responding.

Missing Data

Participants with 3 or more item non-responses were eliminated (n = 120). Individuals who answered more than 1 validity check question incorrectly or who completed the same survey repeatedly in wave 1 were removed from the dataset ($n = 58$). The resulting n was 401. The average age of participants in the first wave was 20.5 years with a SD = 4.8 years. The demographic description of the participants is listed in Table 1.

Table 1: *Participants' gender, race, marital status, and college status*

Variables	Male (N=124)		Female (N=275)	
	N	%	N	%
Race				
White	91	22.8	199	49.8
Black	12	3.0	32	8.0
Asian/Pacific Islander	12	3.0	26	6.6
Native American	2	.5	1	.4
Other	6	1.5	17	4.3
Ethnicity				
Non-Hispanic /Latino	98	24.4	204	50.9
Hispanic/Latino	26	6.5	71	17.7
Marital status				
Not married	117	29.2	254	63.5
Married	7	1.7	21	5.2
College status				
Freshman	49	12	118	28.9
Sophomore	37	9	43	10.5
Junior	22	5.4	56	13.7
Senior	16	3.9	60	14.7
Unclassified	2	.5	4	1

[1]*Two participants listed "other" for Gender.*

Statistical Methods

All statistical analyses were performed in SPSS version 26. The Social Distance Item

Pool first underwent a series of Exploratory Factor Analyses (EFAs) with Principal Axis

Factoring. This approach is recommended when there is little theoretical or a priori guidance

available about the factor structure and the initial goal is to empirically summarize and identify

latent dimensions within a dataset (Tabachnick & Fidell, 2013). This statistical approach is

considered appropriate for the purposes of narrowing down a large pool of items to a smaller set

of constructs or factors and is consistent with the exploratory nature of this study.

The impact of the current pandemic on the participants was assessed with the Pandemic Adverse Events Scale which lists common experiences as yes/no questions. Table 2 presents the participants' responses to these questions. Unemployment of a household member was the most endorsed adverse event, where 45.9% of participants experienced this event.

Table 2*: Participants' self-reported experience on the Pandemic Adverse Events Scale*

Question	Yes		No	
	N	%	N	%
Have one (or more members) in your household become (or remained) unemployed the past month	184	45.9	217	54.1
Have there been any days the past month that you didn't know where your next meal was coming from, or you involuntarily ate less than you needed?	39	9.7	362	90.3
Have you had a close friend or family member pass away in the past month?	39	9.7	362	90.3
Have you been tested for COVID-19?	59	14.7	342	85.3
If you have been tested for COVID-19, did you test positive?[1]	6	10.2	45	76.3
Have there been barriers to obtaining the medicines you need the past month?	30	7.5	369	92.0
Have there been barriers for your receiving health care the past month?	64	16.0	337	84.4

Justification of Factorial Techniques

In order to fulfill the first purpose of this study, which was to develop a reliable and valid measure of social distancing, an exploratory factor analysis (EFA) was conducted to ascertain the underlying factors that exist in the social distance item pool. Prior to the EFA, descriptive analysis of the items was evaluated for skewness and kurtosis. Sample size was then evaluated. Multiple metrics for ascertaining the appropriateness of the size of a dataset exist. One rule of thumb is to have a 10 to 1 ratio of respondents to items while other sources suggest a minimum requirement of 300 respondents (Tabachnick & Fidell, 2013; Floyd & Widaman, 1995). Therefore, the cleaned dataset, having an *n* of 401, meets both metrics provided by existent guidelines (Tabachnick & Fidell, 2013; Floyd & Widaman, 1995). Additionally, a KMO index was also used to evaluate sample adequacy. The KMO should be at least .6 (Tabachnick & Fidell, 2013; Floyd & Widaman, 1995) and these are reported with the EFA's conducted below.

An EFA is often used in scale development and "seeks to describe and summarize data by grouping together variables that are correlated. The variables themselves may or may not have been chosen with potential underlying processes in mind." (Tabachnick and Fidell, 2013, p. 614). As this study is the first step to creating and validating the Social Distance Scale the use of exploratory factor analysis is an appropriate technique to discover the latent factors within the social distance item pool.

<center>Results</center>

Descriptive analyses were conducted on items to evaluate range, skewness, and kurtosis. As a result, items SD8 and SD10 were removed due to extreme violations of normality. Further analyses were performed on the remaining 27-item pool.

A preliminary EFA with principal axis factoring (PAF) was performed on the 27-item pool using an oblique rotational procedure (Direct Oblimin). This produced a weak factor correlation matrix which indicated that oblique rotational methods were not necessary (Tabachnick & Fidell, 2013).

Then, an EFA using PAF was performed using an orthogonal (Varimax) rotational procedure. The number of factors were not specified and eigenvalues above 1.0 were extracted. This analysis produced an 8-factor rotated solution. The communalities table was then examined and items with extracted communalities below .30 were removed (see Table C1). This process led to the removal of six items; SD4, SD6, SD11, SD16, PIS3, and PIS6. The obtained KMO for this analysis was adequate at .753. Bartlett's Test of Sphericity was significant ($\chi 2$ (351) = 2270.575, $p < .05$), indicating that correlations in the matrix are present and that the dimensions of the data set can be reduced.

A third EFA using PAF with varimax rotation was conducted on the 21 retained items. The number of factors were not specified in this analysis and factors with eigenvalues above 1.0 were extracted. This analysis produced a 7-factor rotated solution. The communalities table was examined and item SD5 was removed due to having a loading below .30. Chi-Square goodness of fit tests were performed for solutions between 1 and 7 factors and they were significant for the

<center>15</center>

1 through 6 factor solutions. The test for the 7-factor solution was non-significant ($\chi 2$ (71) = 87.5, $p < .09$) thus supporting a 7-factor solution.

A fourth EFA using PAF with varimax rotation specifying 7-factors was then performed on the 20-item pool, based on the previous results. Generally, three items per factor are needed to identify common factors. Of the 7-factors, 3 were removed due to an insufficient number of items loading on them (less than 3). The remaining 4 factors were as follows: Factor one with items SD2, SD3, SD9, and PIS4; factor two with items SD7, SD13, SD14; factor three with items SD12, PIS7, PIS9, and PIS10; and factor four with items SD1, SD15, and SD17. Factor 5, 6, and 7 were the two item factors and the associated items PIS5, PIS8, PIS1, PIS2, PIS11, and PIS12 were removed.

A fifth EFA using PAF with varimax rotation was conducted on the retained 14 items. The number of factors were not specified in this analysis and factors with eigenvalues above 1.0 were extracted. This analysis produced a 4-factor rotated solution (see Table 3). The obtained KMO for this analysis was adequate at .762. Bartlett's Test of Sphericity was significant ($\chi 2$ (91) = 1226.302, $p < .05$). The scree plot produced by this analysis supported the use of a 4-factor solution (see Figure 1). All 14 items loaded on the same four factors as they did in step 4.

Table 3: Factor loadings based on a Principal Axis Factoring with Varimax Rotation for 14 items from the Social Distance Item Pool (N = 401)

	Factor			
	1	2	3	4
SD1 During the past month, I have stayed at least 6 feet away from other people when outside of my home:	.370	.189	.048	**.421**

SD2 During the past month, I have gone to small social gatherings with less than 10 people in public places, such as public parks or restaurants:	**.683**	.027	.031	.208
SD3 During the past month, I have gone to small social gatherings with less than 10 people in private places, such as my friend's home:	**.712**	.034	.052	.042
SD7 During the past month, I have worked/studied from home:	-.031	**.532**	-.003	.247
SD9 During the past month, I have left my home to purchase gas, work, medicine, and groceries:	**.458**	.351	.107	-.003
SD12 During the past month, we have had small gatherings of family members at my place, or a relative's home:	.359	-.038	**.423**	-.014
SD13 During the past month, I have been required to go to my place of employment, worksite, or school (away from home):	.226	**.855**	-.062	-.092
SD14 During the past month, I have been able to stay at least 6 feet away from other people when at my place of employment, worksite, or school:	.139	**.550**	.153	.290
SD15 During the past month, I have worn a face mask when I am in public, at my worksite, or school:	.184	.079	.110	**.619**
SD17 During the past month, when I am away from home, I have used hand sanitizer or washed my hands after I have touched objects such as doorknobs, computer keyboards, computer mice etc.:	.036	.091	.087	**.550**
PIS4 I have been physically distant from others living outside of my home this past month:	**.575**	.171	.102	.192
PIS7 I have visited my elderly family members (who are 65 and up) this past month:	.101	.022	**.522**	.067
PIS9 I have visited with family members (64 and below) living outside of my home this past month:	.108	.004	**.789**	.086
PIS10 I have visited my family members who have serious health conditions this past month:	-.071	.065	**.530**	.100

Extraction Method: Principal Axis Factoring with Varimax Rotation.

a.   Rotation converged in 5 iterations.
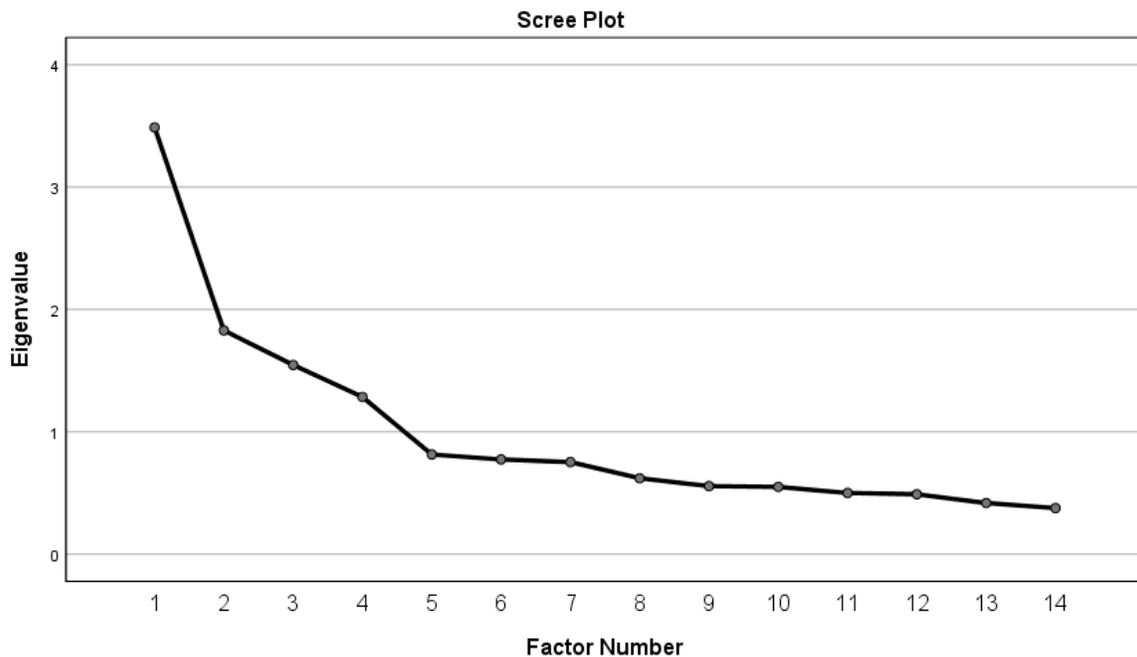
Figure 1: *Scree Plot of Eigenvalues for Rotated 4-Factor Solution*

At this point the internal consistency of the 4 Factors was evaluated. Factor 1 had a Cronbach's Alpha of .717, Factor 2 had a Cronbach's Alpha of .669, Factor 3 had a Cronbach's Alpha of .656, and Factor 4 had a Cronbach's Alpha of .588. The internal consistency of factors was not improved with the removal of any item. The Cronbach's Alpha for the four factors were in the acceptable range.

The items loading highly on each factor were reviewed to best characterize the factor interpretation and label. Indeed, the items that loaded together on each factor appeared to have face validity and related to similar constructs and behavioral patterns. The 4 items loading on Factor 1 included behaviors such as attending social gatherings and leaving the home to obtain groceries or medicine and was labeled Isolation from Community (IC). The 3 items loading on Factor 2 described an individual's ability to work remotely and the overall level of social

18

distancing at their workplace and was labeled Work from Home (WH). The 3 items loading on

Factor 3 addressed contact with family members of different ages and family members with

health concerns and was labeled Family Contact (FC). The 3 items loading on Factor 4 included

behaviors such as mask wearing, hand washing, and maintaining a 6-foot distance from others

and was labeled Protective Behaviors (PB). These four factors are treated as the four subscales of

the Social Distance Scale (SDS v.1).

The test–retest reliability of the four factors (now subscales) was examined using the data

collected from wave 2, the subsample of 109 participants who completed the survey twice, on

average 7-days apart. The results indicated good test–retest reliability for the four subscales. The

test-retest correlations between the wave 1 and 2 administrations were .66, .80, .78 and .69 for

the Isolation from Community (IC) behaviors subscale, Work from Home (WH) subscale,

Family Contact (FC) subscale, and the Protective Behaviors (PB) subscale respectively.

<u>Description of Factors</u>

Instructions for scoring the four subscales are found in Table 4.

Table 4: *Scoring Instructions for the Social Distance Scale (v.1)*

Isolation from Community (IC, 4 items)	Sum Items: SD2, SD3, SD9, PIS4
Work from Home (WH, 3 items)	Sum Items: SD7, SD13, SD14
Family Contact (FC, 4 items)	Sum Items: SD12, PIS7, PIS9, PIS10
Protective Behaviors (PB, 3 items)	Sum Items: SD1, SD15, SD17

The theoretical range of scores for the different subscales are as follows: IC (0 to 16), WH (0 to 12), FC (0 to 16), and PB (0 to 12). The intercorrelations of the 4 subscales is displayed in Table 5. The means and standard deviations of the subscale totals by sex are displayed in Table 6.

Table 5*: Intercorrelations Social Distance Scale (v.1) subscale scores*

Variables	WH	FC	PB
IC	.33	.25	.26
WH		.10	.24
FC			.19

Table 6: *Participants' Social Distance Scale (v.1) subscale scored by gender*

Variables	Male (N=124)		Female (N=275)		Total (N=401)	
	M	SD	M	SD	M	SD
IC	10.2	3.1	10.3	3.0	10.3	3.0
WH	9.5	2.9	9.7	2.8	9.6	2.8
FC	13.8	2.3	14.1	2.1	14.0	2.2
PB	10.0	1.9	10.7	1.5	10.5	1.7

[1]Two participants listed "other" for Gender.
<u>Note:</u> CI = Isolation from Community subscale, WH = Work from Home subscale, FC = Family Contact subscale, PB = Protective Behaviors subscale

<u>Relationship of Empathy to Social Distancing</u>

The secondary purpose of this research was to examine the relationship between trait empathy and social distancing. A median split was performed, sorting participants into a Low Empathy group (*n*=218; 80 males, 138 females) defined by a score of 4 or lower on the SITES and a High Empathy group defined by a score of 5 on the SITES (*n*=180; 44 males, 136 females).

A MANCOVA was performed using the four subscales of the SDS v.1 with Empathy Group and Gender Group as fixed factors and the SDRS-5 as a covariate. The significance level was set at .05 and Pillai's trace was used to determine multivariate differences (Tabachnick and Fidel, 2013). The SDRS-5 was found to be a significant multivariate covariate (F (4, 390) = 2.977, p = .019, Pillai's V = .030, partial $\eta2$ = .030). The SDRS-5 was a significant covariate for both the IC (F (1, 398) = 7.157, p = .008, partial $\eta2$ = .018.) and PB (F (1, 398) = 5.402, p = .021, partial $\eta2$ = .014). The relationship between SDRS-5 and the IC and PB variables are presented in Figure 2 by dividing participants into low and high social desirability groups using a median split on SDRS-5. This figure shows that individuals who responded with higher levels of social desirability tended to report higher levels of adherence to these social distancing behaviors.

Figure 2: *Comparison of Isolation from Community (IC) and Protective Behavior (PB) scores by socially desirable responding (SDRS-5)*
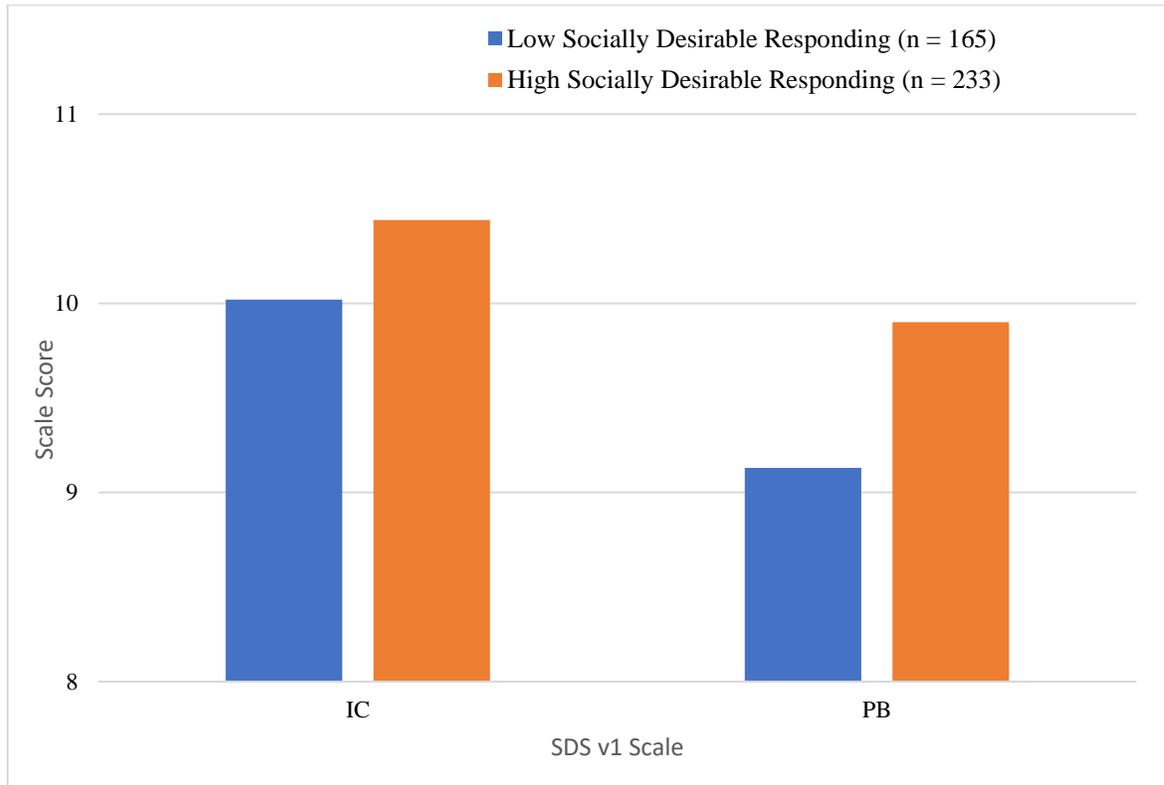
Note: higher values indicate great adherence to social distancing.

A significant main effect for Empathy Group was observed (F (4, 390) = 3.473, p = .019, Pillai's V = .030, partial $\eta2$ = .030). Empathy Group was significantly related to IC (F (1, 398) = 4.20, p = .041, partial $\eta2$ = .011), WH (F (1,398) = 4.818, p = .029, partial $\eta2$ = .012), and PB (F (1,398) = 11.886, p = .001, partial $\eta2$ = .029). Figure 3 illustrates this finding. This figure reveals that the High Empathy group reported greater adherence on these 3 measures of social distancing.

Figure 3: *Comparison of Isolation from Community (IC), Work from Home (WH), and Protective Behavior (PB)*

scored by Empathy Group
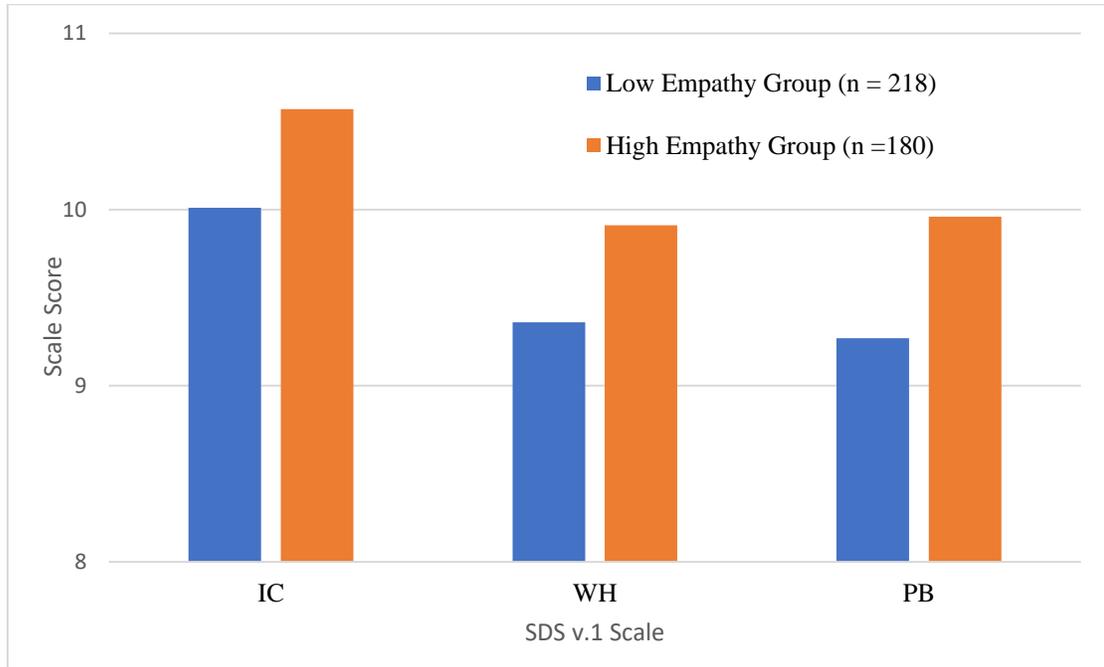
Note: higher values indicate great adherence to social distancing.

A significant main effect for Gender Group was obtained (F (4, 390) = 2.439, p = .047, Pillai's V = .024, partial $\eta2$ = .024). However, Gender Group was only significantly related to PB (F (1,398) = 7.481, p = .007, partial $\eta2$ = .019).

Figure 4: *Comparison of Protective Behavior (PB) scored by Gender Group*
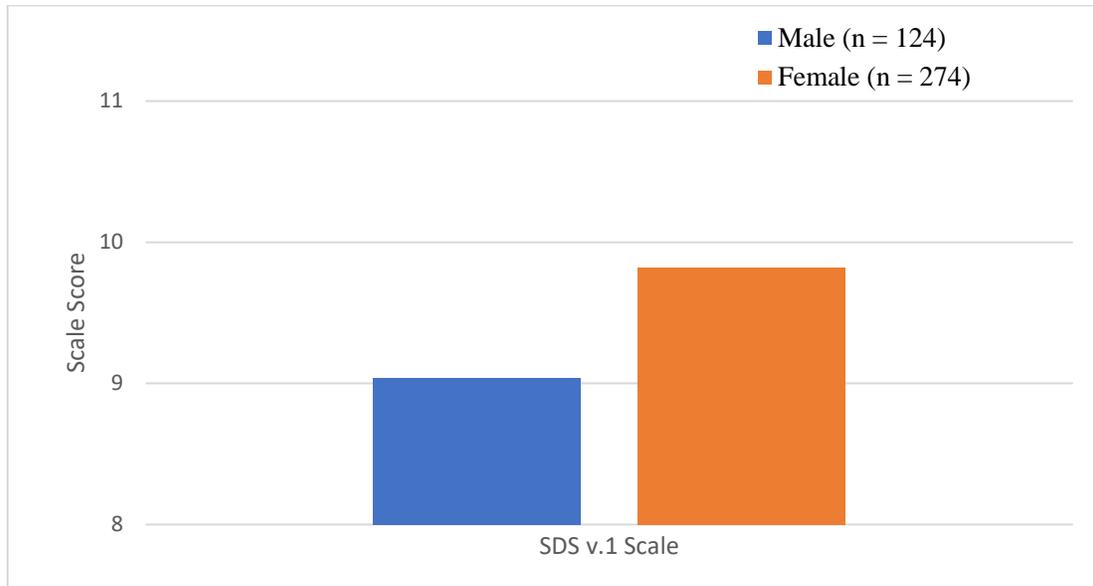
Note: higher values indicate greater adherence to social distancing.

There was no significant interaction found between Empathy Group and Gender Group. The means and standard deviations by Empathy Group and Gender Group are displayed in Appendix I.

CHAPTER 5: DISCUSSION

COVID-19 is currently a severe worldwide pandemic. The primary purpose of this thesis is to describe the development of a brief self-report screening measure of adherence to social distancing and self-protective behaviors in pandemic situations. I began by generating 29 items currently established as primary strategies to prevent and reduce the spread of the COVID-19 infection. This item pool underwent a series of EFAs for the purpose of item reduction and to identify the underlying constructs of social distancing and self-protective behaviors. A 14-item SDS v.1 that contained four subscales was refined. These four subscales represent constructs that are congruent with current theories about the behavioral and social risk factors for infection (Selden & Berdahl 2020; De Bruin & Bennett 2020; Fisher et al., 2021; Chu et al., 2020) that include community and family exposure, the inability to work from home, and lower adherence with self-protective behaviors. Initial means and SD of the summary scores for the four subscales is presented by gender for young adults in Table 6. At this time, this table may be used for interpretation with young adult college students between the ages of 18 and 25 in the United States. Additional normative work needs to be conducted before it may be used in Spanish, other age ranges, other socioeconomic groups, and internationally.

<u>Social and Psychological Implications</u>

The second purpose of the research was to demonstrate the utility of the social distancing constructs in understanding their relationship with social and personality characteristics. Indeed, two social distancing dimensions were found to differ by level of participant social desirability. That is, individuals who displayed higher instances of socially desirable responding were more likely to score higher on IC and PB.

It was also hypothesized that participants high in self-reported trait empathy would demonstrate higher levels of social distancing than individuals that are low in self-reported trait empathy. In line with the hypothesis, it was found that participants in the High Empathy Group scored higher on three dimensions of social distancing. Specifically, those high in self-reported trait empathy scored significantly higher on the IC, WH, and PB subscales of the SDS v.1. A single dimension of social distancing, PB, was found to differ by participant gender. Specifically, participants who identified themselves as women were significantly more likely to engage in protective behaviors such as mask-wearing and hand washing than those who identified as men. This is of particular note as COVID-19 deaths are significantly higher for men than they are for women, despite the fact that infection rates are quite similar (Griffith et al., 2020), indicating that they are at an elevated risk

Clinical Implications

Future pandemics are likely to arise. Before treatment and vaccines can be developed, social distancing will be key to managing infection rates in current and future novel pandemics. Due to this, understanding the social and psychological factors that impact the public's willingness to comply with social distancing is paramount. The SDS v.1 was written to be useful in future situations calling for these types of prevention strategies. The utility of the scale needs to be established both for COVID-19 and other highly contagious respiratory infections.

I encourage the use of the SDS v.1 but urge caution in interpreting individual patient summary scores until additional normative data are collected and psychometrically evaluated. Ideally, initial use may simply involve reviewing items with the individual patient to identify potentially problematic areas. Results of such a review with the patient can inform healthcare

recommendations and counseling in an educational and supportive context with them. In the meantime, collection of local norms for future use is encouraged.

There is no cost for the use and dissemination of the SDS v.1. The question stems may be found on Table 3. The English translation of the entire social distance item pool is presented in Appendix D. I recognize that additional research with the entire item pool and the development of additional items may be needed.

<div align="center">Limitations and Future Directions</div>

One limitation of the current psychometric study is the tremendous situational variance associated with the pandemic. The data collection in this study took place in Florida in the summer of 2020 between May 22nd and July 31st. This timeframe included periods of both relatively low rates of infection and a period where a large surge in the rates of COVID-19 infection occurred. During this time participants were adapting to the transition from on campus instruction to remote learning. In addition to potential physical location changes experienced during data collection, information and recommendations disseminated about self-protection during the pandemic changed significantly over this study period. These mixed messages present a challenge to research on the prevention of COVID-19 (Ioannidis, 2019). More specifically, in March and April 2020 the CDC and several government representatives communicated several mixed messages, which may have discouraged the use of face masks and social distancing. Taken together, time 1 and time 2 responses may have been collected when perceptions of the importance of adherence differed greatly. These considerations, therefore, exemplify the

potential impact of situational variance on increasing the error inherent in behaviorally anchored scales.

As implied in the discussion above, the generalizability of our initial results remains to be established. The development of any self-report scale requires multiple studies and replication. The current study justifies further efforts to continue this research. These results need to be replicated with more heterogenous populations across age ranges, socioeconomic groups, and various national/cultural regions. Additionally, construct validity must be demonstrated by establishing high correlations of the subscales with other measures they should correlate with such as cell phone location data (convergence), and low correlations with other measures they should not correlate with such as social desirability (divergence). Ultimately construct validity needs to be established with confirmatory factor analysis (CFA) using a large sample, most likely with pooled cross-sectional data from multiple locations.

The SDS v.1 is not intended to substitute for contact tracing, which has a different purpose. Many specific locations and situations are likely to be identified as super spreader events through professional contact tracing. Such events are likely to lead to highly specific information which is difficult to categorize. For example, items such as SD8, SD11, and SD16 did not load on the current factors, and they included the use of public transportation, nursing home visits, and emergency room visits. Each of these areas are important to assess. They may or may not load on one of the factors with different samples in the future. To reiterate, the SDS v.1 is intended to be used as brief measure of adherence to behavioral prevention strategies during pandemics such as COVID-19 in both research and clinical screening contexts.

The development of additional items for the SDS v.1 should be considered to enhance the three factors that were eliminated because of too few items. The eliminated factors related to emotional distancing, use of technology for social contact, and family illness. I have made the entire social distance item pool available in appendix D because the scale may evolve with future research and with a more heterogeneous sample.

The second portion of this study was designed to demonstrate the utility of the social distancing constructs in understanding their relationship with social and personality characteristics. Potential benefits of this research include identifying protective behavioral traits and identifying at risk individuals and groups which can then inform public health campaigns. Recent research has provided evidence that empathy appeals are effective in increasing social distancing behaviors when they are combined with informational health messaging (Pfattheicher, Nockur, Böhm, Sassenrath, & Petersen, 2020). This study's findings are that Empathy Group was a marker of the differences observed in the various dimensions of social distancing. This provides further evidence for a connection between social distancing and empathy. It is therefore possible that incorporating stronger empathetic messages in public health communications, particularly messages aimed at increasing an individual's perception of themselves as an empathetic person, could improve overall public attitudes about social distancing.

Additionally, it was found that men engaged in significantly fewer protective behaviors than women. This presents an area of concern, particularly when taking this information in conjunction with the fact that men have dramatically higher COVID-19 mortality rates. Public health messages aimed at increasing men's frequency of social distancing behaviors, specifically

encouraging protective behaviors such as mask-wearing, are therefore of particular importance to reduce male deaths.

Research performed on self-image and smoking has found that a person's identity as a "smoker" or a "non-smoker" is a good predictor of future smoking behaviors (Falomir-Pichastor, Invernizzi, Mugny, Munoz-Rojas, & Quiamzade, 2002). Similarly, research performed on smokers entering smoking cessation programs has demonstrated a link between positive perceptions of those who smoke and a decreased likelihood of successfully quitting (Gibbons & Eggleston, 1996). This line of research provides interesting insight into the factors which motivate engagement in and termination of unhealthy behaviors. Associating health behaviors such as engaging in or refraining from smoking with self-identity appears to be a strong indicator of an individual's willingness to begin to smoke. Similarly, positive mental representations of individuals who partake in this harmful health behavior also appears to impact smoking habits. Therefore, it is possible that public health campaigns aimed toward making men associate mask-wearing with typically desirable masculine traits might have the potential to act as effective interventions. For example, presenting mask-wearing as a behavior which demonstrates personal strength and a commitment to protect one's community may serve to improve men's adherence to protective behaviors.

APPENDIX A: RECRUITMENT FLYER

EXPLANATION OF RESEARCH

Title of Project: Construction of the Social Distance Scale

Principal Investigator: Jeffrey E. Cassisi, Ph.D., Professor

Co-Investigator: Thien-An-Le, Doctoral Student
                        Michaela Prachthauser, Honors in the Major student

Faculty Supervisor: Jeffrey E. Cassisi, Ph.D., Professor

You are being invited to take part in a two-part research study. Your participation in one or both parts is voluntary.

The current study aims to survey students' engagement in social distancing efforts. The purpose is to develop a short questionnaire which asks about the different ways people are willing to socially distance themselves.

You will be presented with an online survey which will ask a series of questions about your demographic background and different social distancing measures that you may be engaged in. You may take the survey on any computer, mobile device, or tablet you prefer. Please be assured that your responses will be kept in encrypted computer files in the Health Psychology Laboratory (PSY 205) and no identifying information will be collected. This online survey should take less than 30 minutes to complete. After completing the survey, you will have the opportunity to re-take the same survey approximately 2-weeks later for additional credit.

Your participation in this study is voluntary. You are free to withdraw your consent and discontinue participation in this study at any time without prejudice or penalty. Your decision to participate or not participate in this study will in no way affect your relationship with the University of Central Florida (UCF), including continued enrollment, grades, employment or your relationship with the individuals who may have an interest in this study.

There is no foreseeable risk or discomfort to you by participating in this research. However, if participation in this research raises any concerns regarding your health, medical services at the UCF Student Health Center are available to you. Please visit http://shs.sdes.ucf.edu/ for more information.

You will receive .5 SONA credit for completing the survey. Perhaps more importantly, your responses will help us understand the impact of the pandemic, in terms of family, employment and other economic factors.

You must be 18 years of age or older to take part in this research study.

Study contact for questions about the study or to report a problem: If you have questions, concerns, or complaints, please contact Dr. Jeffrey E. Cassisi, Faculty Supervisor, Department of Psychology by email at Jeffrey.Cassisi@ucf.edu

IRB contact about your rights in this study or to report a complaint: If you have questions about your rights as a research participant, or have concerns about the conduct of this study, please contact Institutional Review Board (IRB), University of Central Florida, Office of Research, 12201 Research Parkway, Suite 501, Orlando, FL 32826-3246 or by telephone at (407) 823-2901, or email irb@ucf.edu.

APPENDIX B: DEMOGRAPHICS QUESTIONNAIRE

Demographic Questions

DQ1 **What is your age?**

      ○

_____

_____

`JS`

DQ2 **What year where you born?**

      ○

_____

_____

DQ3 **What is your gender?**

○ Male (1)

○ Female (2)

○ Other (3)

DQ4 **What is your Ethnicity?**

○ Non-Hispanic/Non-Latino (1)

○ Hispanic/Latino (2)

DQ4a **If you indicated Hispanic/Latino, which culture do you identify with?**

○ Cuban (1)

○ Mexican (2)

○ Puerto Rican (3)

○ Mixed (4)

○ Other (5)

DQ5 **What is your Race?**

○ White (1)

○ Black or African American (2)

○ American Indian or Alaska Native (3)

○ Asian (4)

○ Native Hawaiian or Pacific Islander (5)

○ Other (6)

DQ6 **What is your Marital Status?**

○ Single (never married) (1)

○ Married/Living with Partner (2)

○ Divorced/Separated (3)

○ Widowed (4)

X→

V1 **For this item, please select or mark "No"**

○ Yes (1)

○ No (0)

DQ7 What is your classification in college?

- ○ freshman/first-year (1)

- ○ sophomore (2)

- ○ junior (3)

- ○ senior (4)

- ○ unclassified (5)

DQ8 **What languages do you currently speak fluently? (Please select all that apply)**

- ☐   English (1)

- ☐   Spanish (2)

- ☐   other (3)

DQ9 **What language is spoken at home?**

- ○   _____

_____

DQ10 **Are you currently employed?**

○ Yes (1)

○ No (2)

DQ10a **If yes, are you currently employed full-time or part-time?**

○ Full-Time (1)

○ Part-Time (2)

DQ10b **If no, are you a**

○ Homemaker (1)

○ Student (2)

○ Retired (3)

○ Disabled (4)

○ Unemployed and looking for a job (5)

DQ11 Including yourself, how many people have lived in your household the past month?

      ○   _____

  _____

APPENDIX C: IRB EXEMPTION LETTER

UNIVERSITY OF CENTRAL FLORIDA

EXEMPTION DETERMINATION

May 6, 2020

Dear Jeffrey Cassisi:

On 5/6/2020, the IRB determined the following submission to be human subjects research that is exempt from regulation:

Type of Review:	Modification / Update
Title:	Construction of the Social Distance Scale
Investigator:	Jeffrey Cassisi
IRB ID:	MOD00000968
Funding:	None
Grant ID:	None
Documents Reviewed:	• Measures (updated), Category: Survey / Questionnaire; • Request for Exemption (updated), Category: IRB Protocol;

This determination applies only to the activities described in the IRB submission and does not apply should any changes be made. If changes are made, and there are questions about whether these changes affect the exempt status of the human research, please submit a modification request to the IRB. Guidance on submitting Modifications and Administrative Check-in are detailed in the Investigator Manual (HRP-103), which can be found by navigating to the IRB Library within the IRB system. When you have completed your research, please submit a Study Closure request so that IRB records will be accurate.

If you have any questions, please contact the UCF IRB at 407-823-2901 or irb@ucf.edu. Please include your project title and IRB number in all correspondence with this office.

Due to current COVID-19 restrictions, in-person research is not permitted to begin until you receive further correspondence from the Office of Research stating that the restrictions have been lifted.

Sincerely,

Kamille C. Birkbeck

Kamille Birkbeck
Designated Reviewer

APPENDIX D: SOCIAL DISTANCE ITEM POOL

Social Distance Item Pool

Check the one alternative that best describes your activities DURING THE PAST MONTH:

X→

SD1 During the past month, I have stayed at least 6 feet away from other people when outside of my home:

○ Never (0)

○ Rarely (1)

○ Sometimes (2)

○ Often (3)

○ Always (4)

X→

SD2 During the past month, I have gone to small social gatherings with less than 10 people in <u>public places</u>, such as public parks or restaurants:

○ Never (4)

○ Once a week or less (3)

○ 2-3 times a week (2)

○ 4-6 times a week (1)

○ Daily (0)

X→

SD3 During the past month, I have gone to small social gatherings with less than 10 people in <u>private places</u>, such as my friend's home:

○ Never (4)

○ Once a week or less (3)

○ 2-3 times a week (2)

○ 4-6 times a week (1)

○ Daily (0)

X→

SD4 During the past month, I have gone to crowded places and large gatherings of people, such as concerts and sporting events:

○ Never (4)

○ Once a week or less (3)

○ 2-3 times a week (2)

○ 4-6 times a week (1)

○ Daily (0)

X→

SD5 During the past month, I have shaken hands with people out of habit:

   ○ Never (4)

   ○ Rarely (3)

   ○ Sometimes (2)

   ○ Often (1)

   ○ Always (0)

X→

SD6 During the past month, I have used grocery/restaurant delivery services instead of going to the store:

   ○ Never (0)

   ○ Rarely (1)

   ○ Sometimes (2)

   ○ Often (3)

   ○ Always (4)

X→

SD7 **During the past month, I have worked/studied from home:**

○ Never (0)

○ Rarely (1)

○ Sometimes (2)

○ Often (3)

○ Always (4)

X→

SD8 **During the past month, I have used public transportation (bus, subway, or train):**

○ Never (4)

○ Rarely (3)

○ Sometimes (2)

○ Often (1)

○ Always (0)

X→

SD9 **During the past month, I have left my home to purchase gas, work, medicine, and groceries:**

○ Never (4)

○ Once a week or less (3)

○ 2-3 times a week (2)

○ 4-6 times a week (1)

○ Daily (0)

X→

SD10 **During the past month, I have gone to a nursing home:**

○ Never (4)

○ Once a week or less (3)

○ 2-3 days a week (2)

○ 4-6 days a week (1)

○ Daily (0)

X→

SD11 **During the past month, I have gone to an emergency room or medical clinic:**

○ Never (4)

○ Only once or twice (3)

○ 3-5 times in the past month (2)

○ Several times a week (1)

○ Daily or almost daily (0)

X→

SD12 **During the past month, we have had small gatherings of family members at my place, or a relative's home:**

○ Never (4)

○ Once a week or less (3)

○ 2-3 times a week (2)

○ 4-6 times a week (1)

○ Daily (0)

X→

SD13 **During the past month, I have been required to go to my place of employment, worksite, or school (away from home):**

○ Never (4)

○ Once a week or less (3)

○ 2-3 times a week (2)

○ 4-6 times a week (1)

○ Daily (0)

X→

SD14 **During the past month, I have been able to stay at least 6 feet away from other people when at my place of employment, worksite, or school:**

○ Never (0)

○ Rarely (1)

○ Sometimes (2)

○ Often (3)

○ Always, or I do not leave home for these activities (4)

SD15 During the past month, I have worn a face mask when I am in public, at my worksite, or school:

○ Never (0)

○ Rarely (1)

○ Sometimes (2)

○ Often (3)

○ Always (4)

SD16 During the past month, I have worn disposable gloves when I am in public, at my worksite, or school:

○ Never (0)

○ Rarely (1)

○ Sometimes (2)

○ Often (3)

○ Always (4)

SD17 **During the past month, when I am away from home I have used hand sanitizer or washed my hands after I have touched objects such as door nobs, computer keyboards, computer mice etc.:**

○ Never (0)

○ Rarely (1)

○ Sometimes (2)

○ Often (3)

○ Always (4)

PIS1 **I have had phone contact with others outside of my family this past month:**

○ Daily (0)

○ 4-6 times a week (1)

○ 2-3 times a week (2)

○ Once a week (3)

○ Never (4)

X→

PIS2 I have had video contact with others outside of my family this past month:

○ Daily (0)

○ 4-6 times a week (1)

○ 2-3 times a week (2)

○ Once a week (3)

○ Never (4)

X→

PIS3 I have connected with others using social media this past month:

○ Daily (0)

○ 4-6 times a week (1)

○ 2-3 times a week (2)

○ Once a week (3)

○ Never (4)

X→

V2 **I have never heard of something called Facebook:**

○ True (1)

○ False (0)

X→

PIS4 **I have been physically distant from others living outside of my home this past month:**

○ Always (4)

○ Most of the time (3)

○ About half the time (2)

○ Sometimes (1)

○ Never (0)

X→

PIS5 I have been emotionally distant from others living outside of my home this past month:

○ Always (4)

○ Most of the time (3)

○ About half the time (2)

○ Sometimes (1)

○ Never (0)

X→

PIS6 I have attended religious services at my place of worship this past month:

○ 4-6 times a week (0)

○ 2-3 times a week (1)

○ Once a week (2)

○ Occasionally, but I stay in my car in the parking lot and 6 feet away from others (3)

○ Never (4)

X→

PIS7 I have visited my elderly family members (who are 65 and up) this past month:

○ Daily (0)

○ 4-6 times a week (1)

○ 2-3 times a week (2)

○ Once a week (3)

○ Never (4)

X→

PIS8 I have been emotionally distant from family members living outside of my home this past month:

○ Always (4)

○ Most of the time (3)

○ About half the time (2)

○ Sometimes (1)

○ Never (0)

X→

PIS9 I have visited with family members (64 and below) living outside of my home this past month:

○ Daily (0)

○ 4-6 times a week (1)

○ 2-3 times a week (2)

○ Once a week (3)

○ Never (4)

X→

PIS10 I have visited my family members who have serious health conditions this past month:

○ Daily (0)

○ 4-6 times a week (1)

○ 2-3 times a week (2)

○ Once a week (3)

○ Never (4)

X→

PIS11 I have cared for family members outside of my household who are ill this past month:

○ Daily (0)

○ 4-6 times a week (1)

○ 2-3 times a week (2)

○ Once a week (3)

○ Never (4)

X→

PIS12 I have attended funeral services this past month:

○ Yes, I have gone to more than two at funeral halls or at places of worship (0)

○ Yes, I have gone to one at a funeral hall or at a place of worship (1)

○ Yes, I have gone to more than two, but I stayed outside, or in my car, and 6 feet away from others (2)

○ Yes, I have gone to one, but I stayed outside, or in my car, and 6 feet away from others (3)

○ No, or I viewed the online service for the person who passed (4)

58

APPENDIX E: SINGLE ITEM TRAIT EMPATHY SCALE

Single Item Trait Empathy Scale

ES1 To what extent does the following statement describe you: "I am an empathetic person,"

○ 1. Not very true of me (1)

○ 2. (2)

○ 3. (3)

○ 4. (4)

○ 5. Very true of me (5)

APPENDIX F: PANDEMIC ADVERSE EVENTS SCALE

Pandemic Adverse Events Scale **Please make all ratings for the PAST MONTH**

PIS13 Have one (or more members) in your household become (or remained) unemployed the past month:

○ Yes (1)

○ No (2)

PIS14 Have there been any days the past month that you didn't know where your next meal was coming from, or you involuntarily ate less than you needed?

○ Yes (1)

○ No (2)

PIS15 Have you had a close friend or family member pass away in the past month?

○ Yes (1)

○ No (2)

PIS16 Have you been tested for COVID-19?

○ Yes (1)

○ No (2)

PIS16a If you have been tested for COVID-19, did you test positive?

○ Yes (1)

○ No (2)

○ I haven't been told the results (3)

PIS17 Have there been barriers for your receiving health care the past month?

○ Yes (1)

○ No (2)

PIS18 Have there been barriers to obtaining the medicines you need the past month?

○ Yes (1)

○ No (2)

APPENDIX G: FIVE ITEM SOCIALLY DESIRABLE RESPONSE SET

SDRS-5 Scale

Listed below are a number of statements concerning personal attitudes and traits. Read each item and select the answer that is more appropriate for you

SDRS5-1 **I am always courteous even to people who are disagreeable.**

○ Strongly agree (1)

○ Agree (2)

○ Unsure (3)

○ Disagree (4)

○ Strongly disagree (5)

SDRS5-2 **There have been occasions when I took advantage of someone.**

○ Strongly agree (1)

○ Agree (2)

○ Unsure (3)

○ Disagree (4)

○ Strongly disagree (5)

SDRS5-3 **I sometimes try to get even rather than forgive and forget.**

○ Strongly agree (1)

○ Agree (2)

○ Unsure (3)

○ Disagree (4)

○ Strongly disagree (5)

SDRS5-4 **I sometimes feel resentful when I don't get my way.**

○ Strongly agree (1)

○ Agree (2)

○ Unsure (3)

○ Disagree (4)

○ Strongly disagree (5)

SDRS5-5 **No matter who I'm talking to, I'm always a good listener.**

○ Strongly agree (1)

○ Agree (2)

○ Unsure (3)

○ Disagree (4)

○ Strongly disagree (5)

APPENDIX H: PROMIS SOCIAL SUPPORT SCALES

Promise Social Support Scales

Instrumental Support

Please respond to each item by marking one box per row.

CCC31052x **Do you have someone to help you if you are confined to bed?**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

CCC31055x **Do you have someone to take you to the doctor if you need it?**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

CCC31065x **Do you have someone to help with your daily chores if you are sick?**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

SS6 **Do you have someone to run errands if you need it?**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

○ End of Block: PROMIS Instrumental Scale

○

☐ Start of Block: PROMIS Social Isolation Scale

Social Isolation

Please respond to each item by marking one box per row.

UCLA11x2 **I feel left out**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

UCLA13x3 **I feel that people barely know me**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

X→

V3 For this item, please select or mark 'Sometimes.'

○ Never (1)

○ Rarely (1)

○ Sometimes (0)

○ Usually (1)

○ Always (1)

UCLA14x2 I feel isolated from others

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

UCLA18x2 **I feel that people are around me but not with me**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

○ **End of Block: PROMIS Social Isolation Scale**

○

☐ **Start of Block: PROMIS Informational Support Scale**

Informational Support
Please respond to each item by marking one box per row.

FSE31054x2 **I have someone to give me good advice about a crisis if I need it**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

SS7x **I have someone to turn to for suggestions about how to deal with a problem**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

FSE31058x2 I have someone to give me information if I need it

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

SSQ7x I get useful advice about important things in life

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

○ **End of Block: PROMIS Informational Support Scale**

○

☐ **Start of Block: PROMIS Emotional Support Scale**

75

Emotional Support

Please respond to each item by marking one box per row.

FSE31053x2 **I have someone who will listen to me when I need to talk**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

FSE31059x2 **I have someone to confide in or talk to about myself or my problems**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

SS12x I have someone who makes me feel appreciated

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

SSQ3x2 I have someone to talk with when I have a bad day

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

○ End of Block: PROMIS Emotional Support Scale

○

☐ Start of Block: PROMIS Companionship Scale

Companionship

Please respond to each item by marking one box per row.

FSE31057x2 **Do you have someone with whom to have fun?**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

FSE31061x2 **Do you have someone with whom to relax?**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

FSE31068x **Do you have someone with whom you can do something enjoyable?**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

UCLA15x2 **Can you find companionship when you want it?**

○ Never (1)

○ Rarely (2)

○ Sometimes (3)

○ Usually (4)

○ Always (5)

APPENDIX I: SUPPLEMENTARY MATERIALS

Table 7: *Comparison of scores on the four Social Distance Scale (SDS v.1) subscales by Empathy Group and*

Gender Group

Variable	Low Empathy Group - Males		Low Empathy Group - Females		High Empathy Group - Males		High Empathy Group – Females	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Isolation from Community (**IC**)	9.8	3.12	10.10	2.86	10.80	2.80	10.49	3.12
Work from Home (**FC**)	9.10	2.98	9.51	2.76	10.18	2.55	9.82	2.88
Family Contact (**FC**)	13.86	2.12	13.91	2.04	13.70	2.54	14.21	2.21
Protective Behavior (**PB**)	8.64	2.48	9.63	1.88	9.77	1.84	10.02	1.94

Note: higher values indicate great adherence to social distancing.

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