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# Development of a Brief Motivational Interview to Promote Help Seeking Among Individuals with Symptoms of Blood, Injection, Injury Phobia

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Development of a Brief Motivational Interview to Promote Help Seeking Behavior  
among Individuals with Symptoms of Blood, Injection, Injury Phobia

David Joel Finitzis

University of Connecticut, 2015

Medical procedures involving needles play a vital role in the prevention, diagnosis, and treatment of human disease. For those who experience symptoms of Blood, Injection, Injury (BII) phobia, situations involving blood and needles elicit clinical levels of anxiety and subsequent avoidance. This avoidance increases their risk for suboptimal health outcomes. Empirically supported interventions still possess an important limitation in that these can only be used with individuals who overcome their avoidance enough to seek help. Epidemiological data shows that behavioral avoidance typically debuts in adolescence, underscoring the importance of this developmental context in order to promote engagement in care. Current interventions take the form of general information campaigns relying on group delivery or technological formats using a “one size fits all” approach, and measuring attitudes more often than behavior. A tailored, one-on-one approach targeting individuals in distress may demonstrate greater efficacy. Motivational Interviewing (MI) has demonstrated effectiveness across multiple behavior change domains. Self-Determination Theory provides an empirically derived theoretical foundation for understanding how MI works. The current project first conducted formative elicitation research to guide development of a single session, peer-delivered,

motivational interview. After development, we then conducted a pilot study using a randomized, controlled trial to test whether the newly developed intervention would evince changes in attitude, motivation, and behavior related to mental health help-seeking. Thirty participants completed interviews and focus groups for the purpose of formative elicitation. The themes of low mental health literacy and stigma helped guide intervention development. Sixty-one participants were randomized to receive either the newly developed intervention or an information only control condition. Both groups exhibited similar changes in attitude and motivation, however, a 2 (groups) by 3 (time points) ANCOVA test revealed an overall effect of time on average motivation scores ( $F=4.910$ ,  $p=.01$ ) and a time by group interaction effect ( $F=3.881$ ,  $p=.03$ ) indicating that the two groups exhibited different patterns of change. Secondary effect size analysis provided evidence for a more sustained effect in the intervention condition relative to control in both motivation and attitude measures. At one month follow up, participants in the intervention condition reported greater numbers of help seeking behavior ( $IR=2.46$ ;  $95\%CI=1.40, 4.35$ ;  $p=.002$ ). The intervention was considered acceptable by the participants and feasible to conduct using peer-facilitators. This preliminary pilot provides support for the use of MI in this context. The document concludes with explication of limitations of this study and suggestions for future directions.

Development of a Brief Motivational Interview to Promote Help Seeking Among  
Individuals with Symptoms of Blood, Injection, Injury Phobia

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B.A., Bowdoin College, 1995

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Development of a Brief Motivational Interview to Promote Help Seeking Among  
Individuals with Symptoms of Blood, Injection, Injury Phobia

Presented by

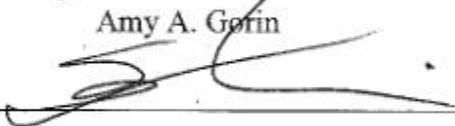
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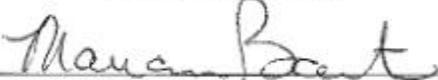
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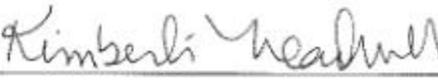
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## TABLE OF CONTENTS

Abstract.....	i
Introduction.....	1
Blood, Injection, Injury Phobia:	
Clinical Features.....	1
Epidemiology.....	3
Effective Treatments.....	5
Mental Health Help Seeking in Emerging Adulthood.....	7
Barriers to Help Seeking.....	9
Interventions to Promote Help Seeking.....	13
Motivational Interviewing.....	19
Self-Determination Theory.....	22
Cognitive Evaluation Theory.....	25
Present Study.....	28
Methods, Study 1.....	29
Participants.....	29
Procedure.....	30
Measures.....	31
Data Analysis.....	31
Methods, Study 2.....	32
Participants.....	32
Procedure.....	32

Measures.....	33
Interventionist Rating Form.....	33
Injection Phobia Scale-Anxiety.....	33
Center for Epidemiological Studies-Depression Scale.....	33
Interpersonal Support Evaluation List.....	34
Treatment Motivation Questionnaire.....	34
Attitudes Toward Seeking Professional Help-short form.....	34
Personal Perspectives Questionnaire.....	35
Direct Solicitation.....	35
Satisfaction Survey.....	35
Help Seeking Questionnaire.....	36
Intervention Condition, Content and Process.....	36
Control Condition Content.....	39
Data Analytic Plan.....	40
Results, Study 1.....	42
Demographics and Assessment of Sampling Bias.....	42
Coding and Content Analysis.....	43
Hypothesis 1: Congruence of Qualitative Themes.....	43
Participant Satisfaction with Study Format.....	45
Results, Study 2.....	46
Demographics and Assessment of Sampling Bias.....	46
Effectiveness of Randomization Scheme.....	47

Hypothesis 2: Attitudes Toward Seeking Professional Help by Group.....	47
Hypothesis 3: Motivation To Seek Treatment by Group.....	48
Hypothesis 4: Behavioral Outcomes by Group.....	48
Hypothesis 5: Participant Satisfaction with Intervention.....	50
Interventionist Ratings.....	51
Discussion.....	52
Purpose of the Present Study.....	52
Hypothesis 1.....	54
Hypothesis 2.....	56
Hypothesis 3.....	58
Hypothesis 4.....	59
Hypothesis 5.....	58
Limitations.....	61
Future Directions.....	64
References.....	66
Tables.....	74
Figures.....	85

## Introduction

Whether through vaccination, drug administration, or the collection of blood specimens for analysis, medical procedures involving needles play a vital role in the prevention, diagnosis, and treatment of human disease (Adis, 2004; Wright, Yelland, Heathcote, Ng, & Wright., 2009; Yim, 2006). Moreover, a new era of personalized medicine is at hand that promises to elevate care to a new stratum of precision through the use of genetic testing (Personalized Medicine Coalition [PMC], 2014a). The current literature boasts over 100 genetic tests designed to enhance doctors' ability to monitor and treat a host of diseases, including but not limited to cystic fibrosis, heart disease, arthritis, transplant immunologic status, and a multitude of cancer types (PMC, 2014b). Whether one considers these recent groundbreaking advances in personalized medicine or the canon of routine vaccination, optimal care hinges on the use of needles for blood or injection. Most individuals experience venipuncture and other medical procedures involving needles as moderately uncomfortable but tolerable; however, for a significant proportion, situations involving blood and needles elicit clinical levels of anxiety and subsequent avoidance. This necessarily increases the risk of suboptimal health outcomes.

### **Blood, Injection, Injury Phobia**

Blood-injection-injury (BII) phobia is part of the classification of anxiety disorders known as specific phobias; these are characterized by:

Marked fear or anxiety about a specific object or situation...[that] almost always provokes immediate fear... [that] is out of proportion to the actual danger posed...and to the sociocultural context...lasting six months or more. **The phobic object or situation is actively avoided** [emphasis added] or endured with intense fear or anxiety...causes clinically significant distress or impairment in social occupational, or other important areas of functioning...[and] is not better explained by the symptoms of another mental disorder (APA, 2013).

It is the particular criterion of behavioral avoidance that lends a unique gravity to the lived experience of BII phobia and can carry significant individual and public health risks when individuals avoid regular blood tests and needed treatments such as vaccinations. Like other anxiety disorders, BII phobia involves activation of the stress response, including the locus ceruleus-norepinephrine system (Graeff & Zangrossi Jr., 2010). This stimulates the sympathetic nervous system and leads to symptoms commonly referred to as the “flight or fight” response: diaphoresis, pupillary dilation, reduced gastric motility, as well as elevations in heart rate, respiratory rate and blood pressure (Chrosous, 2009). In addition to these, however, an individual experiencing BII phobia can also present with a vasovagal response; a rebound stimulation of the parasympathetic nervous system that causes hypotension and can manifest as dizziness and syncope (fainting). This symptom is unique to BII phobia, but not uniform: prevalence estimates range from 11-20% among those with this fear (Alegría et al., 2007; Wright, Yelland, Heathcote, & Ng, 2009). Some have suggested that risk of a syncopal event adds an additional layer of fear and avoidance to the phenomenological experience of this phobia, as individuals fear not only the situation involving needles, but also worry about fainting (Yim, 2006).

A dimensional conceptualization of this unique clinical and health phenomenon is vital in order to keep with the current diagnostic standard. In the recently released DSM-5, clinically relevant symptoms in the absence of full diagnostic criteria may still be characterized as “Other Specified” conditions (p.24; APA, 2013). This is important when we consider that individuals that may not meet full diagnostic criteria but who present with behavioral avoidance of medical situations risk an identical set of health sequelae as those who would be diagnosed with BII phobia. So while this paper considers BII-phobia

as a frame for the research question, the construct of interest remains the associated behavioral avoidance of medical situations.

### *Epidemiological Features*

According to results of the National Comorbidity Replication Survey (NCS-R), a probability sample of mental disorders in U.S. households, BII phobia is the second most common phobia in the U.S., representing 13.93% of the specific phobias endorsed in that survey (NCS-R; Alegria et al., 2007). The Collaborative Psychiatric Epidemiological Surveys (CPES) combines NCS-R with two additional surveys that attempt to capture a more ethnically diverse sample: the National Survey of American Life (NSAL; Jackson et al., 2008) and the National Latino and Asian American Study (NLAAS; Alegria & Takeuchi, 2008). The NSAL focused on estimating the prevalence of mental disorders among African American and Afro-Caribbean populations of the United States (Jackson et al., 2008), while the NLAAS obtained a representative sample of Latino and Asian American U.S. households for the same purpose (Alegria & Takeuchi, 2008). The CPES conducted its surveys between 2001-2003 using DSM-IV-TR criteria and yielded a lifetime prevalence estimate of 12.91% in the U.S. population. In addition, 77.5% of these individuals reported avoiding “going to a doctor or a dentist or a hospital, getting a shot or injection” because of their fear (Alegria et al., 2007).

Examinations of blood and needle fear with behavioral avoidance in medical settings are most relevant to the current study, and several estimates from healthcare settings are currently available. An early study examined 400 young adults visiting a travel clinic in Haifa, Israel; of these, 21.7% (95% CI: 17.3-25.6%) affirmed a fear of needles. Being a regular injector (e.g., insulin dependent diabetic) or a medical staff

person did not significantly impact individuals' likelihood of endorsing this fear (Nir, Paz, Sabo, & Potasman, 2003). A more recent Australian study surveyed 177 patients across the general practice of five physicians, asking "Are you afraid of needles?" Those who indicated the response, "yes, I avoid them if I can," were classified as fearful for the purpose of their analysis. These researchers found, like Nir and colleagues, that 22% of their sample met this criterion. Of these, 20.5% reported the associated vasovagal response. Behavioral avoidance was prevalent. Many of those fearful of needles reported that they would avoid future flu shots (64.1%) or tetanus shots (30.8%) because of their fear. Over three-quarters reported they would avoid donating blood (76.9%) and a significant percentage reported they would choose to forgo their doctor's recommended blood test (10.3%). Over one quarter (25.6%) reported that they would forgo receiving intravenous pain medication because of their fear. Researchers compared these with rates of avoidance among those in the sample who denied a fear of needles and found significant differences across groups (Wright et al., 2009). Most recently, Harris Interactive was hired by the corporation Target to conduct a survey in anticipation of the retailer's rollout of in-store influenza vaccines available that fall. The survey sampled 2,160 adults over two days in July 2012 and found that 23% would skip being vaccinated due to fear or dislike of needles (Jahnke, 2012). Regardless of the estimate used, there appears to be a significant proportion of individuals whose fears prompt them to risk poorer health outcomes in order to avoid a feared situation.

As with most anxiety disorders, a fear of needles typically emerges in childhood. Mean age of incidence from the NCS-R sample was 12.9 years (SD=10.30). This large standard deviation suggests that the actual cases are not closely grouped around the mean,

increasing risk of skew. In fact, the median age of incidence was younger (10 years old) and nearly two-thirds of respondents reported first experiencing this fear before school-age (Alegria et al., 2007). Results of the NCS-R also show that in contrast to the fear's early onset, behavioral avoidance typically debuts in adolescence with a median age among respondents of 15.5 years (Kessler, Berglund, Demler, Jin, Merikangas, & Walters, 2005). These data underscore the importance of the developmental context in understanding and addressing BII phobia symptoms.

### *Effective Treatments*

As a specific phobia, BII phobia would theoretically respond to interventions using established approaches of behavioral exposure and cognitive/behavioral stress management, and this is in fact the case (Barlow, 2002). Further, the need to address the fainting response unique to this phobia led to the development of applied tension protocols (Kozak & Montgomery, 1981); this approach relies on brief (10-15 second) periods of tensing the arms, legs, and trunk, in order to raise systolic blood pressure and counteract the rebound hypotension that precedes syncope. Reviews of the literature testing these interventions unanimously demonstrate support for their effectiveness. Ayala and colleagues (2009) generated effect size estimates for studies that tested exposure paradigms, relaxation training, applied tension protocols, and combinations of these approaches in both multiple (five to ten session) and single session treatments. These studies were few in number ( $k=5$ ), relied on self-report measures as outcomes, and did not use professional therapists, relying instead on research staff trained in the particular intervention being administered. Across all studies, large effect size (ES) differences (Hedge's  $g = .76-2.01$ ) were observed in participants receiving intervention

relative to no treatment controls. The most modest ESs observed in single-session, exposure only groups (Ost et al., 1992) while effect sizes were consistently largest among groups receiving applied tension interventions (Hellstrom et al., 1996; Ost et al. 1989; Ost et al., 1991) and were largely maintained at both six month and one year follow up assessments. An earlier review (Patel, Baker, & Nosarti, 2005) examined two additional smaller, observational pilots using either computer-assisted (Coldwell, Getz, Milgrom, Prall, Spadafora, & Ramsay 1998) or manualized/therapist delivered (Mohr, Cox, Epstein, & Boudewyn, 2002) treatments with a professional therapist. Results were consistent with the findings of Ayala and colleagues, and used more objective behavioral outcomes (e.g., ability to self-inject).

These empirically supported interventions still possess an important limitation in that they can only be used with individuals who overcome their avoidance enough to seek help; individuals who maintain their avoidance will remain at greater risk of morbidity and poorer health outcomes. If we accept that avoidance is the most important symptom of BII phobia from a health behavior perspective, and that this typically coincides with emerging adulthood, then it is necessary to consider the developmental perspective in examining how best to promote engagement in care.

### *Mental Health Help Seeking in Emerging Adulthood*

The modern transition from child to adult has been described as a precarious, uncertain developmental period with a threshold that perpetually recedes into the future; young people experience little sense of control or mastery in advance of this period (Allen & Allen, 2009). The concept of emerging adulthood (Arnett, 2000) aptly describes this as a liminal phase between the dependency of childhood/adolescence and the

responsibilities accompanying adulthood. Elaborating further, Arnett writes, “adult commitments and responsibilities are delayed while the role experimentation that began in adolescence continues and in fact intensifies” (*ibid*, p. 470). This may increase the challenges associated with increased social and academic demands as young people transition to college. University life is accompanied by exponential increases in personal and educational autonomy while conversely, there are significant decreases in parental supervision; students become nearly if not totally responsible for the management of their mental and physical health care during this period (Cleary, Walter, & Jackson, 2011).

Simultaneously, greater stress associated with the social and academic demands of university can exacerbate symptoms of psychological disorders (Burris, Brechting, Salsman, & Carlson, 2009; Usher, Jackson, & O’Brien, 2005) including BII phobia symptoms. The interaction of these two factors among individuals with BII phobia symptoms would predict increased avoidance of medical testing, blood donation, and vaccination compliance. While there has been no examination of the prevalence or severity of BII phobia symptoms in the university student population specifically, our own work suggests that clinically relevant symptoms of BII phobia are common. In a brief, ten item survey conducted in 2013 with 1875 undergraduate men and women enrolled in introductory psychology courses, nearly one quarter (24.6%) endorsed fainting or dizziness during medical procedures involving needles or injections; 18.8% reported avoiding medical appointments because of needle/injection fear; and 10.7% endorsed both statements (Finitisis, Cruess, Burnham, & Goshe, 2014). Given the prevalence of the problem and the availability of effective treatment, it is important to

consider how best to connect people to care, i.e., which factors facilitate and which hinder help-seeking behavior in this population.

### *Barriers to Help Seeking in Emerging Adults*

Timely engagement in mental health care for individuals with BII phobia symptoms would reduce anxiety symptoms and increase students' ability to function and enjoy their college years. However, despite a high prevalence of disorders among university students, levels of engagement in care and help seeking behavior are low (Hunt & Eisenburg, 2010). European researchers' findings suggest that as few as one-third to one-fifth of young people meeting criteria for diagnosable anxiety disorders or depression had used mental health services in the last year (Zachrisson, Rodje & Mykletun, 2006) or ever in their lifetimes (Essau, 2005). In the U.S., researchers using a 1,720 person, national probability sample compared rates of service utilization by age in a more fine-grained analysis. Rates of utilization varied, with outpatient services 20% lower among the 16-25 year old population than among older and younger groups. Moreover, when compared to individuals just a year or two younger, mental health care utilization of all types among those aged 18-19 falls to half (18 cases per 1,000) and remains low through the early 20s, primarily driven by declines in use of outpatient services (Pottick, Bilder, Stoep, Warner, & Alvarez, 2008). It is striking that this decline in young people's engagement in mental health care corresponds to an age when many young people experience vulnerability related to their mental health.

A number of studies have sought to identify common barriers to and facilitators of help seeking for psychological distress among young people, with Europe and Australia at the forefront of the field. One such study interviewed a community sample of 23 young

adults (16-24 years old) from a UK population survey whose responses indicated current significant clinical symptoms of distress or a past history of diagnosis and/or treatment. The results describe a pattern wherein respondents tended to minimize their distress, characterizing it as normal and not sufficiently severe to seek help. There was a lack of mental health literacy observed such that respondents tended to describe their clinically significant symptoms as “normal” and endorsed a need for treatment only at severest levels (e.g., florid hallucinations, active suicidality) of the mental illness continuum. Interviewees used stigmatizing language to describe those living with mental illness (e.g., “weird,” or “nutty”) and reported avoiding seeking help from a desire to be “normal” and a fear of acquiring a permanent stigmatized identification (Biddle, Donovan, Sharp, & Gunnell, 2007). Gilchrist and Sullivan (2006) drew comparable conclusions in their similarly structured study of young adults in Australia. Respondents endorsed fears that social networks of their peers would judge them as weak if they sought help for psychological problems. Additional themes to emerge described concerns about trust and confidentiality in the professional therapy context while conversely, respondents doubted in the abilities of non-professional resources (friends, family, community members) to provide adequate assistance. Several studies conducted this formative work exclusively with university students. One such report by Francis and colleagues (2007) found that even among a sample of psychology majors, there was a substantial lack of information about the availability of services. Respondents again expressed concern over the lack of anonymity, endorsed beliefs in self-reliance for mental health issues, and attached stigma to the act of help-seeking. Interviews with a sample of U.K. medical students yielded fears that help-seeking would not be a confidential process and that admitting to

problems with “stress” would affect future job prospects. Respondents endorsed feelings of shame and embarrassment and the identification of mental illness with “weakness” (Chew-Graham, Rogers, & Yassin, 2003).

These themes drawn from qualitative research are reinforced by a larger scale survey literature that highlights congruent factors. One survey asked 294 U.S. university students aged 18-31 who had screened positive for major depression or anxiety to select barriers to mental health service utilization that they had experienced in the past 12 months. As observed in the formative work by Biddle and colleagues, the majority of respondents here reported minimization of symptoms (e.g., “stress is normal” (51%). Over one-third endorsed a belief that “the problem will get better by itself” (37%), suggestive of poor mental health literacy. A significant proportion also endorsed items connected to stigma or embarrassment such as “I worry what others will think of me” (20%), and “I am concerned about privacy” (16%); fears of future career repercussions (10%) also manifested (Eisenberg, Golberstein, Gollust, 2007). Marcus & Westra (2012) analyzed epidemiological data on 123 Canadian young adults (16-24 years old), revealing unique characteristics among this age group as compared to the 881 adult respondents in the dataset. The researchers queried respondents on their ability to correctly identify a mental illness from a short vignette, and also elicited beliefs about treatment (i.e., whether it is best to deal with mental health symptoms through professional help seeking or informal support) and the results again echoed a theme observed in the formative elicitation work. Compared to those older than 25 years, young adult respondents were significantly less likely to personally support the use of professional mental health services, and were more interested in managing mental health problems by themselves or

with the informal support of family and friends. Both groups performed similarly in their ability to correctly identify the condition described in the vignette. Another study compared 774 students (18-24 years old) to 422 staff at an Australian university. Here again, while each group performed similarly in correctly recognizing the mental health problem the students were significantly less likely to seek help from a professional and significantly more likely to seek help from friends or family, further suggesting a deficit in mental health literacy related to the management and treatment of symptoms (Reavley, McCann, & Jorm, 2012).

Recent quantitative work has also added support to the early qualitative finding that stigma likewise hinders young people's help seeking behavior. A national survey of 3,021 Australian young people aged 15-25 attempted to assess five dimensions of stigma with regard to mental illness help-seeking in this population. The researchers conducted interviews by phone and employed one of six randomly selected vignettes for each interviewee (e.g., depression, social phobia, psychosis, etc.). Interview questions assessed attitudes related to stigma and personal help seeking intentions, as well as important covariates (e.g., prior experience with mental health care, mental health literacy). Both personal and perceived stigma of dangerousness and "weak not sick" (i.e., mental illness as a deficit of character rather than an illness) made up the first four dimensions assessed, with social distance (i.e., not associating with others who have mental illness) the fifth and final facet of stigma explored in this study. Of these, the personally held belief that a mental disorder is a personal weakness rather than a sickness (i.e., a personal "weak not sick" stigma) most consistently predicted less intention to seek professional help relating to depression; depression with alcohol abuse ; depression with

suicidal ideation ; and PTSD . This consistent result among these fine-tuned analyses echo the qualitative work and suggest a mediator for avoiding treatment may reside in a self-stigma and a sense of shame (Yap, Reavley, & Jorm, 2013; Yap, Wright, & Jorm, 2011).

In the same way that early qualitative work saw evidence of problem minimization and negative perceptions of care and care-providers, a population based study conducted by the Netherlands Department of Public Health in association with Erasmus Medical Center concurs. Researchers surveyed 362 young adults (19-32 years old) who scored above the 90<sup>th</sup> percentile on measures externalized or internalized problems and analyzed their mental health service use and reported barriers to care. Despite having an accessible nationalized health system, 65.5% of participants reported not seeking help for their symptoms. The most common barriers were attitudinal with 91.6% endorsing the self-reliant statement, “I wanted to solve problems on my own” and over 70% each endorsing such minimizing statements as, “I did not think problems were serious,” and “I thought problems would go away.” Nearly one third (32.2%) cited perceived stigma (“I was afraid of what other people might think if I sought help”) as a barrier. Interestingly, only 14.7% of respondents reported any prior negative experience with the care system (Vandusden, Mulder, van der Ende, van Lenthe, Machenbach, & Verhulst, 2008).

Thus it would appear that multiple phenomena of mental health literacy, stigma, and problem minimization interact to present significant barriers and predict low rates of engagement in mental health care or even informal help seeking behaviors among young people (Gulliver, Griffiths, & Christensen, 2010).

*Interventions to promote help-seeking*

The promotion of help seeking for mental health issues has relied primarily on information/educational approaches (Gulliver, Griffiths, Christensen, & Brewer, 2012) within classroom or online venues. In one such study, health professionals provided a 90-minute psychoeducational intervention to 506 adolescents in public high school, designed to promote mental health literacy, in particular how to access care for emotional difficulties. Measures of help-seeking intention were compared between this group and a no treatment control condition at both a four and eight-week follow up. Assignment to conditions was not randomized, but rather depended on grade level. Significant increases in intention (i.e., “if you had [a personal or emotional problem] how likely are you to talk to a professional about it?”) were observed in the experimental groups at follow up; similar changes were not observed in the control condition (Deane, Wilson, & Russell, 2007). Another school based study enrolled 182 high school students to receive five teacher delivered modules over two 48 minute periods designed to address, recognizing when a friend needs help; what types of helpers are available; professional confidentiality; barriers to raising concerns with a friend; barriers to professional help-seeking; and assisting a friend to access professional help and accessing reliable help-seeking websites (Berridge, Hall, Dillon, Hides, & Lubman, 2011). Self-report data was collected post intervention with the majority of students (>70%) greater confidence toward help seeking and greater knowledge related to professional confidentiality.

More recently, researchers have sought to reach young people through their Internet use, developing online content to promote professional help seeking for psychological difficulties. One such study developed an online game designed to

influence attitudes toward professional help seeking for mental health difficulties.

Attitudes toward help-seeking were assessed with a single item rating scale; participants were asked to consider how likely they would be to seek help from a health professional if they ‘felt sad, down or miserable for more than two weeks’. This was assessed at pre-intervention, post-intervention, and at a two-month follow-up. Using intention-to-treat (ITT) analyses, researchers conducted repeated measures ANOVAs, finding a significant time effect, showing that willingness to seek help increased from pre- to post-program, and at follow-up. However, effects were small, and the study was hampered by technical issues (data usage in downloading game content) that limited participant access and engagement in the intervention (Burns, Durkin, & Nicholas, 2009).

Another study examined how use of the “Reach Out” website ([www.reachout.com.au](http://www.reachout.com.au)) may influence help-seeking behavior (Shandley, Austin, Klein, & Kyrios, 2010). The website offers information through fact sheets on mental health issues affecting youth and on-demand pod casts on mental health topics. It also offers unique web based features such as links to social media sites, access to a trained peer- and staff-moderated community forum, and an online game that provides life-skills training in a virtual setting. An annual online survey collected data on behaviors and attitudes from 904 Reach Out users, the majority (60%) of whom was aged 16-25 years. Results indicated that most respondents used the site on an ongoing basis (87%;  $n=870$ ) and had developed trust in (85%) and referred others (80%) to its community and content. Among 266 respondents who reported “going through a difficult time” in the past 12 months, a majority (59%) reported talking about their difficulties with a professional. Through the medium of the Internet, this site appeared able to provide

information/education and also community/social networking, circumventing the barrier of stigma through anonymity. While these results were generally promising, it remains somewhat unclear how well the constructs were assessed; studies uniformly used single item scales lacking evidence of psychometric soundness (e.g., validity, reliability). This plus the fact that all outcomes were self-report, suggests a high risk of reporting and measurement bias may be present.

Despite increasing pressure to embrace a plurality of designs to test hypotheses and accumulate evidence in Clinical Psychology, the randomized, controlled trial (RCT) remains the putative “gold standard” for the advancement of clinical science (Westen, Novotny, & Thompson-Brenner, 2004). A recent review conducted literature searches in 2011 using multiple electronic databases (PubMed, PsycInfo, Cochrane). Reviewers found six published randomized controlled trials testing interventions to promote help-seeking for anxiety, depression, and/or general psychological distress (Gulliver, Griffiths, Christensen, & Brewer, 2012). Several of these ( $k=3$ ) addressed help-seeking in university students specifically, though intervention modality and outcome measurement varied considerably. In one such study, designed to assess the intervention’s effect on attitudes toward mental health treatment, 80 university students, not included on the basis of any clinical criteria or reported distress, were randomized to conditions. The intervention, based in social/cognitive learning theory, consisted of a video wherein three individuals provide positive accounts of their experiences in psychotherapy; results of this intervention were compared to a time/attention control condition. Researchers used a validated measure and found that attitudes assessed at baseline were comparable across groups; however, assessment at post-video and at 2-week follow up showed a sustained,

time by group interaction with a large effect size ( $F=7.16$ ;  $p=.001$ ; partial  $\eta^2=.24$ ); experimental group participants exhibited significantly more positive attitudes toward psychotherapy as a result of the intervention, at least for the duration of the brief follow up period. Researchers did not report assessing their intervention's impact on treatment seeking behavior (Buckley & Malouff, 2005). Another study used psychoeducational written material to reduce stigma and enhance willingness to seek help for depression. This study recruited 299 students from three universities in Taiwan who were enrolled in introductory psychology courses. Interventions were brief (5-10 minutes) and compared to a no treatment control. Researchers assessed help-seeking willingness using an validated scale and found a significant effect (Cohen's  $d=.32$ ) of the intervention to promote willingness compared to control at two-week follow up. Again, researchers did not report any behavioral assessment related to help-seeking in this study (Han, Chen, Hwang, & Wei, 2006). The last study targeting university students used a 40-minute group session, delivered in classroom to 123 participants. Intervention content was delivered by a psychology graduate student in a lecture format and included psychoeducation to enhance mental health literacy and reduce stigma related to mental illness. Outcomes were assessed using validated measures and again researchers observed enhancements in reported attitudes toward help-seeking in the experimental group ( $t(103) = 2.16, p = .033$ ) with a robust effect size ( $d = .42$ ). In contrast, reports of help seeking behavior at the four-week follow up were low ( $n=2$ ), distributed equally with one participant in each group (Sharp, Hargrove, Johnson, & Deal, 2006).

These results of studies targeting university students were consistent with those using community samples (Gulliver et al., 2012a). Authors observed mixed results

overall among studies with a range of small to medium effects ( $d=.12-.53$ ) and limited effects on behavior. Because Gulliver and colleagues conducted their literature search four years ago, and because research studies included in this review were approximately ten years old, the present study required a repeat search, conducted in April 2015 using the identical search terms included in the supplemental materials of their report. The repeat search yielded one additional RCT; not coincidentally, this study was published by the same group that published the aforementioned review (Gulliver et al., 2012b). In this four arm study, 120 elite athletes attending university were randomized to online delivery of either (1) a mental health literacy/destigmatization condition consisting of psychoeducation on disorder prevalence, treatment, the debunking of stigmatizing myths about depression, and help seeking sources; (2) a “feedback” condition where participants complete self-report measures and receive feedback about their current levels of depression and anxiety and help seeking sources; (3) a help-seeking list only condition; and (4) a no-treatment control condition. Suboptimal retention hampered this study, with less than one quarter of participants ( $n=27$ ) completing all procedures. The study was therefore underpowered to detect the small to medium effects observed in other RCTs of this sort (Gulliver et al., 2012a); indeed, none of the conditions had significant changes from baseline to follow-up in terms of attitudes, intentions, or self-reported help seeking behavior. In secondary analysis, improvements in mental health literacy were noted, with significant differences in depression and anxiety literacy found in the mental health literacy/destigmatization group when compared with the control group. These differences were maintained at three-month follow up. It is unfortunate that a study this rigorously designed suffered from both recruitment and attrition issues. Given the observed effects,

the researchers speculated that a sample size of 500 participants would have been necessary to reasonably avoid Type II error (Gulliver et al., 2012b), leaving its ultimate contribution to the literature unclear.

Several themes emerge from this review of the current intervention literature. Studies were uniformly psychoeducational in content and used a general information campaign structure without targeting those currently distressed or at-risk. Most relied on a group delivery or if individually delivered, used an online format. As such, interventions were more likely to use a “one size fits all” approach without personalized or individually tailored content. Researchers designed studies to measure attitudes, willingness, or beliefs related to help seeking, almost universally omitting measurements of behavior. In addition, evidence for sustained change is limited with few studies reassessing participants at greater than two weeks post intervention. Finally, most studies were atheoretical in the sense that few referenced current social-cognitive theory of individual health behavior change.

However, studies did appear promising in their capacity to influence the cognitive precursors of behavior change (attitudes, beliefs). There is room within the existing literature to expand what is known about interventions that influence help-seeking behavior in relation to specific clinical conditions; that use tailored personalized approaches that measure behavioral outcomes directly; that use more longitudinal designs; and employ theory to guide intervention process and content. Viewing the issue as one of health behavior change provides an alternative framework for conceptualizing professional help seeking that taps a wellspring of theoretically based, empirically supported interventions from the literature.

*Motivational Interviewing*

While it holds the promise of reducing the frequency and severity of symptoms, treatment for BII-phobia involves exposure to the feared stimulus (Barlow, 2002). For someone who has otherwise successfully avoided situations involving blood and needles, contemplation of change by these means is necessarily met with ambivalence. Yet ambivalence *per se* is not typically addressed in interventions to promote help seeking. Motivational Interviewing (MI) is an approach that meets individuals in the midst of their ambivalence (Miller & Rollnick, 2012). In an atmosphere of validation and supportive non-judgment, MI works in a directive way to help people give voice to their reasons for change and weigh these against the present barriers. The interviewer uses targeted, open-ended questions and provides meaningful reflective responses in order to direct and maintain the discussion's focus, but MI continuously recognizes the autonomy of the client as a source of change. The general goals are to: (1) convey empathy; (2) develop discrepancy; (3) "roll" with resistance; and (4) support self-efficacy. Expressions of empathy instill a sense of understanding and acceptance, facilitating change. The client's articulation of discrepancy (e.g., between the current and ideal self or behavior) makes him or her the source of the argument for change, rather than feeling pitted against the interviewer. The concept of "rolling with resistance," acknowledges that arguments for and against change already reside within the client; if the interviewer argues for change, the client naturally "balances the scales" by arguing against it. Instead, the interviewer accepts the existence of arguments against change, enlisting the client as a resource in finding solutions. Finally, if we accept that change resides within the client then that

client's belief in the possibility of change is important. The interviewer supports self-efficacy by collaborating with the client to note skills and past successes (*ibid*).

MI was originally developed for use in alcohol and substance abuse counseling but has been adapted for use in multiple areas of health behavior change, including weight loss (Newnham-Kanas, Irwin, Morrow, & Battram, 2011), smoking cessation (Hettema & Hendricks, 2010), eating disorders (Macdonald, Hibbs, Corfield, & Treasure, 2012; Treasure & Ward, 1997), and to promote medication adherence in people living with HIV (Hill & Kavookjian, 2012). An early meta-analysis (Burke, Arkowitz, & Menchola, 2003) examined the efficacy of interventions adapting MI to address health behavior change. Results were mixed with small to moderate effects ( $d=.25-.57$ ) on outcomes involving alcohol, drugs, diet and exercise. More recent papers have reviewed MI interventions targeting behavior change in emerging adults, and two of these summarize the literature addressing substance abuse. Barnett and colleagues (2012) conducted a qualitative literature review of 39 studies using MI to ameliorate adolescent substance abuse. Of these, 67% reported statistically significant outcomes. The other, a recent meta-analysis of 21 studies representing 5,471 participants, yielded a small but significant effect size post-treatment. Calculation of the Cochrane's  $Q$ -statistic revealed a homogeneity of effect sizes suggesting an absence of moderating factors between studies. Effects were maintained at follow up (Jensen, Cushing, Aylward, Craig, Sorell, & Steele, 2011). These results are consistent with the original targets of MI (alcohol and substance abuse); additional meta-analytic work provides more information of applications of MI to other health behaviors in young populations. Gayes and Steele (2014) conducted a meta-analysis using 37 studies of child and adolescent samples. Studies encompassed eight

separate health domains, including obesity (32%), asthma (13%), HIV/AIDS (10%), and Type I diabetes (8%). An overall weighted effect size was small but significant. The  $Q$  statistic for this overall effect size was likewise significant suggesting the presence of moderating factors among studies. Researchers observed variation in effect size by health domain, with large effects observed in the diabetes interventions, small-medium effects reported across asthma and HIV/AIDS, and small effects found in obesity studies. While this promising report lends support to the adaptation of MI to youth work and beyond its original role in the amelioration of alcohol and other drug use, studies of younger children with more parental involvement were included; this calls into question how transferable their results would be to the question of university students who lack of same level of parental oversight and influence. Another meta-analysis synthesized results of MI studies targeting health behaviors in adolescents other than substance abuse. Their review included 15 studies with a similar distribution of health domains as found in the work of Gayes and Steele (i.e., diabetes care, weight management). A small but significant weighted mean effect size showed overall modest improvements that were sustained at follow up. Studies did not show significant heterogeneity in effect size (Cushing, Jensen, Miller, & Leffingwell, 2014). This revised adolescent-only estimate while retaining statistical significance is noticeably more conservative. To our knowledge there is no report in the existing literature of a theory based, motivational interviewing intervention to promote help-seeking behavior for mental health issues, such as BII phobia symptoms. The application of a sound theory provides a necessary precursor and valuable tool to guide novel intervention development.

*Self-Determination Theory*

Psychology has made the study of motivation a cornerstone within the field (DeAngelis, 2014). While other researchers have successfully operationalized unipolar motivation in the study of health behavior change (Ajzen & Fishbein, 1980; Fisher, Fisher, & Harman, 2003), the model proposed by Self-Determination Theory (SDT) conceptualizes multiple dimensions of motivation as a predictor of behavior. Further, SDT is uniquely suited for investigations using MI (Markland, Ryan, Tobin, & Rollnick, 2005).

Deci and Ryan introduced SDT as a dialectical, organismic approach to understanding human motivation, one that is as rooted in evolutionary biology as it is in social psychology (Ryan, 1995). Organisms are animate systems that act to meet their needs and sustain a homeostatic equilibrium: centers of regulation and action. We also know that even simple living systems possess an inherent thrust toward organization and integration of external stimuli or information (Kandel, 2006). SDT likewise presumes the existence of this inherent tendency toward assimilation and growth: an organismic perspective (Deci & Ryan, 1985). While this idea may appear to be at odds with stricter behaviorist views of the self solely operating in response to external contingencies (Skinner, 1972), it also resonates with anyone who has ever observed children exhibit dogged persistence while working to master aspects of their environment. However, SDT does not ask the reader to choose between the two. The authors recognize that while there is compelling evidence in favor of organismic human tendencies toward active engagement and development, there is also very strong evidence of variation and conditioned responses in behavior (Deci & Ryan, 1985). SDT provides a dialectical framework that integrates these discrepant viewpoints. The theory both (1) assumes the

existence of an intrinsic growth tendency that is fundamental to our humanity and (2) acknowledges that specific environmental factors can support or suppress this (Ryan & Deci, 2002). Thus, SDT seeks to operate at a crossroads of “trait” and “state” factors to describe motivation.

This theory originally derived from work exploring intrinsically motivated behaviors (i.e., those that are inherently satisfying in themselves) and the use of reward systems and other contingency frameworks in the promotion of behavior. Ryan (1995) writes, “Much of human behavior is not intrinsically motivated. Indeed, perhaps the lion's share of social development concerns the assimilation of culturally transmitted behavioral regulations and valuations that are neither spontaneous nor inherently satisfying (p.409).” While originally understood in unipolar terms (i.e., one either has or lacks motivation), the authors found evidence for a more variegated conceptualization of the construct (Deci & Ryan, 1985).

SDT describes a bipolar motivation continuum with the constructs of intrinsic motivation and external regulation anchoring the ends. Externally *regulated* behaviors are those that feel alien to the individual, enacted only in an environment of enforced contingencies (i.e., in order to receive a reward or avoid a punishment). *Introjection* is adjacent along this continuum; introjected behaviors are more self-regulated in that they will occur in the absence of an explicit contingency framework. In spite of this, the behavior is not considered internalized. Rather, the individual enacts an introjected behavior in response to social pressure: to avoid guilt or anxiety, and to maintain self-esteem. Further along this continuum lies *Identification*, representing those behaviors that the individual consciously values and enacts in the absence of social pressure.

*Integration* describes an acquired intentional behavior that is now completely congruent with the self of that individual. In the SDT framework, internalized behaviors are operationally equivalent to intrinsic behaviors though they derive from different sources. Any specific behavior of an individual can be described by its position along this continuum. This dimensional framework also allows its users to describe the process of *internalization*, “the active assimilation of behavioral regulations that are originally alien or external to the self” (Ryan, 1995, p.409). More internalized behaviors are more self-regulated, and more stable over time and across environmental contexts (Ryan & Deci, 2002).

#### *Cognitive Evaluation Theory*

In the same way that all organisms require specific environmental resources in order to thrive, SDT explicates three essential “nutriments” (Ryan & Deci, 2000) that promote internalization and foster self-motivation: these are competence, autonomy, and relatedness. As a subtheory within SDT, Deci and Ryan (1985) proposed Cognitive Evaluation Theory (CET) to model the social and environmental factors that influence motivation. Based on their early work on the influence of external events (e.g., rewards, feedback) on the expression of intrinsically motivated behaviors, CET focuses on the factors of competence and autonomy. Events that promote a perception of competence can enhance intrinsic motivation, while more undermining events will diminish expressions of intrinsically motivated behavior. Studies by the author showed that factors such as an optimal level of challenge and appropriate positive feedback facilitated intrinsic motivation in participants, while those randomized to a negative feedback condition exhibited diminishments. Analyses found that perceived competence mediated

these observed effects, but perceived competence alone was insufficient to explain the variance.

Research demonstrates that feelings of competence work to enhance motivation only when operating in tandem with a sense of self-determination (Deci & Ryan, 2000). Here again, the dialectic of SDT presents itself. The theory posits that perceptions of the self as autonomous and efficacious can derive from extant internal resources, born of childhood developmental support. At the same time, “immediate contextual supports for autonomy and competence” may also intervene to promote motivation and the process of internalization (p. 70). Thus, offering choices and acknowledging feelings can enhance intrinsic motivation by promoting a greater feeling of autonomy (Deci & Ryan, 1985). In contrast, attempts to change behavior using “threats, deadlines, directives, pressured evaluations, and imposed goals” (Ryan and Deci, 2000) diminish intrinsic motivation through instilling the perception of external control.

The third element of relatedness works in concert with these two and seems a uniquely salient construct for the clinical psychologist. This SDT construct gives an unmistakable nod to attachment theory (e.g, Bowlby & Robertson, 1952) noting that securely attached infants display more intrinsically motivated exploratory behaviors than those who are not so supported by their primary caregiver. Similarly, SDT predicts that the interpersonal context will continue to influence intrinsic motivation throughout the lifespan, such that contexts characterized by feelings of belonging and connection to others enhance motivation (Deci & Ryan, 1985; Deci & Ryan, 2000).

We observe in clinical practice (Teyber & McClure, 2011) that the strength of the therapeutic alliance, characterized by empathy and trust, can predict behavior change.

Whereas therapy patients often present with a need to resolve difficulties and assimilate seemingly inconsistent aspects of their experience, therapy through the SDT lens is the establishment of “an interpersonal climate that catalyzes the operation of these inherent synthetic, actualizing, or integrative functions” (p., 402, Ryan, 1995). The authors of SDT have thus articulated three primary factors that both predict the enactment of intrinsically motivated behavior and promote the process of internalizing extrinsically motivated activity. The latter constitutes a reasonable foundation for facilitating health behavior change and integrating this change into the fabric of people’s lives.

Research has applied SDT to medical populations. Both qualitative review (Ryan, Patrick, Deci, & Williams, 2008) and a more recent meta-analysis (Ng et al., 2012) conclude that SDT factors support health behavior change in studies examining medication adherence, weight loss/maintenance, and smoking cessation, among others. Moreover, interventions designed to increase perceived competence and autonomy while supporting relatedness in the patient/provider relationship exert a positive influence relative to controls in randomized controlled trials. Less clear are the specific methodologies that might most expediently use an SDT framework to promote health behavior change. Markland and colleagues (2005) have compared SDT as a conceptual model and MI as an applied practice and the congruence is striking. Miller and Rollnick (2012) describe the foundational tenets of MI as (1) expression of accurate empathy, (2) generation of discrepancy, (3) acknowledging resistance, and (4) support for self-efficacy. One can see how items 1, 3, and 4 correspond to the nutrients of relatedness, autonomy, and competence without any modification whatever. While this in itself is a striking case of independent convergence in understanding how people change, there is a

more nuanced congruence in how the development of discrepancy operates in MI and SDT. It may best be understood as a process of integration or assimilation (Deci & Ryan, 2000) wherein the behavior change is accepted as more in line with the individuals current values, or how they would like to see themselves (Miller & Rollnick, 2012), which facilitates the transition from an externally motivated behavior to one more internalized and identified (Deci & Ryan, 2002).

Casting MI through the SDT lens also highlights a potential danger in implementing this key MI principle. While developing discrepancy can increase awareness of inconsistencies between their current behaviors and their core values and sense of self, this recognition of such a discrepancy could also lead the individual into the partially internalized but still externally attributed regulatory state represented by introjection, where anxiety and/or guilt pressures the individual to change (Markland et al., 2005). Grounding an MI intervention in an SDT framework strengthens its theoretical foundation, and moreover, permits greater methodological rigor by more fully defining the psychological variables (i.e., motivation, internal vs. external) of interest.

### *The Present Study*

The aims of the current project were to first develop and then test a brief motivational interview to promote help seeking behavior among individuals experiencing BII phobia symptoms. The modest literature on this phobia targeting the emerging adult population indicated a need for formative elicitation research to assess barriers to help seeking in this population. *Study 1* conducted interviews and focus groups with individuals reporting BII phobia symptoms from a sample of emerging adults. From these results, and guided by

Self-Determination theory, we designed a peer-delivered, brief (single session) motivational interviewing protocol to specifically address barriers to help seeking among individuals experiencing BII phobia symptoms. In *study 2*, we compared this intervention to an information only control condition using a randomized, controlled trial design, assessing attitudinal, motivational, and behavioral outcomes both immediately and at one month post-protocol.

We hypothesized that thematic analysis of the qualitative data would prove consistent with the existing literature on barriers to help seeking in young people generally (Hypothesis 1). Specifically, we expected that focus group and interview attendees would demonstrate low health literacy with respect to the clinical relevance of BII phobia symptoms and regarding the efficacy of psychotherapeutic treatment. We also believed that Study 1 participants would endorse stigmatized beliefs about their fear and exhibit mistrust of treatment and treatment providers.

With regard to Study 2, we hypothesized that those participants receiving the intervention would score higher on measures of attitudes toward professionals (Hypothesis 2); would endorse a more internalized motivation to seek treatment (Hypothesis 3); and would report and exhibit more help seeking behaviors (Hypothesis 4). Finally, we hypothesized that participants would find the intervention satisfactory and acceptable as operationalized by a study satisfaction survey (Hypothesis 5).

## Methods

### *Study 1*

#### *Participants, Inclusion Criteria, and Recruitment*

We enrolled participants from a prescreened subset of the UCONN Department of Psychology participant pool. Prescreening questions assessed for (1) anxious symptoms related to medical procedures involving needles; and (2) history of behavioral avoidance of medical appointment due to fear of medical procedures involving needles; and (3) a history of fainting in response to medical procedures involving needles. Participants reporting a lifetime history fainting and avoiding medical procedures involving needles because of their fear were eligible to participate. Data was collected in the Fall of 2013 and 30 individuals volunteered to participate in this study, entitled “Talking About Getting Shots, Part 1” (TAGS-1).

#### *Study Procedures*

In order to collect formative elicitation data, undergraduate (peer) members of the research staff conducted semi-structured focus groups and individual interviews with eligible participants. Sessions were held in comfortable, private meeting spaces free from distractions. Sessions were designed to last no more than 120 minutes. Interview guides were developed in accordance with the conduct of formative elicitation work (Krueger & Casey, 2009) with key questions derived from existing literature. These included questions about the participants’ personal experiences in needle/injection scenarios, and their perceived barriers and facilitators of help-seeking for anxiety. We asked participants to describe the first and the most recent time that they faced a decision to

avoid or undergo a medically indicated procedure involving needles/injections, focusing on their reactions to these situations and factors that were related to their reactions. We sought to elicit contextual factors that influenced the participants' decisions. We also assessed participants' degree of concern or distress regarding the consequences of avoiding needle/injection scenarios and their motivation to overcome anxiety for the purpose of obtaining medical treatment. We queried their knowledge of and attitudes toward the current interventions available (e.g., progressive muscle tension, graded exposure).

All interviews and focus groups were audiotaped for transcription and analysis. Undergraduate research assistants transcribed all audio recordings. A graduate student study coordinator performed serial reviews of using randomly selected 5-minute segments of each transcript, directly comparing these to the corresponding section of the audiotape as a validity check.

### *Measures*

As we proposed to develop an intervention using an interview format, all Study 1 participants completed a satisfaction survey to assess acceptability of exploring this topic with this population using the interview/focus group format.

### *Data Analysis*

Any study using convenience sampling raises the specter of sampling bias. In order to assess the risk of this in the present study, important demographic and clinical variables were compared between (1) the university population, represented by those students completing the prescreening questionnaires; (2) the sampling frame of students

who met inclusion criteria; and (3) the study sample. Descriptive statistics were generated to compare all variables of interest and the appropriate statistics (*t* or *F* tests for continuous variables;  $\chi^2$  or Fisher's Exact tests for categorical data) assessed for the presence or absence of differences and thereby determine to the degree of possible sampling bias present.

Using session transcripts, text analysis examined the frequencies of particular key words related to constructs of interest. A standardized coding form was used to extract content and process themes for analysis. Coders reviewed each session using audiotape and transcript simultaneously. Two coders independently reviewed each session, and any discrepancies in extracted data were reconciled through discussion. The resulting database was analyzed using SPSS version 20 (IBM Corp, 2011) for the relative consistency of particular themes

### *Study 2*

This randomized, controlled trial used a longitudinal between subjects design. A detailed description of study methods now follows for "Talking About Getting Shots, Part 2" (TAGS-2).

#### *Participants, Inclusion Criteria, Recruitment, and Randomization*

We enrolled participants from a prescreened subset of the psychology participant pool. Prescreening questions assessed for (1) history of anxious symptoms related to medical procedures involving needles; (2) history of behavioral avoidance of medical appointment due to fear of medical procedures involving needles; and (3) current or past use of mental health services. Participants were included who (1) reported a lifetime history of anxious symptoms related to medical procedures involving needles; (2)

reported a current history (last 12 months) of behavioral avoidance related to medical procedures involving needles; and (3) were not currently in treatment with a mental health care provider. Data was collected from October 2014 to April 2015 and 61 individuals volunteered to participate; for more details on trial recruitment, please see Figure 1 for a CONSORT flow chart.

Participants were randomized using a random number string generated with the software package R (R Core Team, 2014). Each participant was attached to a number at sign up; participants whose files bore odd numbers were assigned to intervention, while those bearing even numbers were assigned to the control condition.

### *Study Procedures*

Upon completion of the consent process, participants completed a pre-intervention assessment using Qualtrics, a web-based platform for administering survey instruments (Qualtrics, 2015). This assessment required approximately 20 minutes to complete. Participants were then randomized to either (1) an individual one-on-one intervention lasting approximately one hour or (2) an information only control condition. Upon completion of procedures, the participants completed a post-assessment requiring approximately 10 minutes. In addition, a 10-minute follow up assessment was sent via email link at one month post intervention for each participant.

### *Materials and Measures*

The *Interventionist Ratings* form gathered feedback from the interventionist's perspective. Interventionists completed this brief form at the conclusion of each session

to rate participant engagement in study procedures and provide a self-rating of intervention delivery quality.

The Pre-intervention assessment battery consisted of the following measures:

The *Injection Phobia Scale-Anxiety* (IPS-A; Olatunji et al., 2010), a validated 18-item self-report instrument, assesses needle/injection anxiety (Olatunji et al., 2010) on a 5-point Likert scale and contains items that assess fear of contact with needles (n=8) and fear of observing an injection (n=10). The measure has shown strong internal consistency ( $\alpha=0.93$ ), high test-retest reliability (ICC=0.88) and demonstrated both convergent validity (i.e., with measures of disgust, contamination fear) and predictive validity (i.e., significantly predicting personal history of dizziness/fainting and behavioral avoidance). Reliability across items in the current study was consistent ( $\alpha=0.907$ ) with this.

The *Center for Epidemiological Studies-Depression Scale* (CES-D; Radloff, 1977) is a widely utilized measure of depressive symptoms in the general population. This 20-item instrument assesses frequency of symptoms experienced during the past 7 days using a 4-point Likert scale. The scale demonstrates high internal consistency ( $\alpha=0.85-0.90$ ) and acceptable test/re-test reliability ( $r=0.51-0.67$ ) and has documented convergent validity with clinician rating scales such as the Hamilton depression scale ( $r =0.69-0.75$ ). Internal consistency in the present study exceeded ( $\alpha=0.915$ ) those originally published by the study's author.

The *Interpersonal Support Evaluation List* (ISEL; Cohen & Hoberman, 1983) lists 48 statements related to an individual's perceived availability of social support. The measure is divided equally into positive statements (e.g., "If I needed an emergency loan of \$100, there is someone [friend, relative, or acquaintance] I could get it from.") and negative

statements (“It would be difficult to find someone who would lend me their car for a few hours.”). Respondents are then asked to indicate the extent to which each statement is true or false about them using a 4-point likert scale (definitely true, probably true, probably false, and definitely false). The measure demonstrates acceptable internal consistency (Chronbach’s  $\alpha=.77$ ) in its original development using college students. In the current university student sample the ISEL’s items showed greater consistency ( $\alpha=0.90$ ) than when the measure was originally normed.

The *Treatment Motivation Questionnaire* is a 26-item measure of motivation for entering psychotherapy. Each item provides a statement about possibly initiating therapy; respondents indicate how true each statement is for them on a 7-point Likert scale. The measure was adapted specifically for this study from the Treatment Motivation Questionnaire Scale of Ryan, Plant, and O’Malley (1995) originally designed for use in the substance abuse treatment context. The instrument assesses extrinsic vs. intrinsic motivation, as well as measuring respondents’ motivations toward help-seeking and confidence in treatment. Internal consistency was high ( $\alpha=0.895$ ) for this specifically adapted version of the validated measure.

The *Attitudes Toward Seeking Professional Psychological Help-short form* (ATSPPH; Fischer & Farina, 1995) is a unidimensional 10-item questionnaire designed to assess individuals’ attitudes toward seeking professional psychotherapy services. The short form of the ATSPPH is a revision of the original 29-item instrument that shows high internal consistency ( $\alpha=0.84$ ). Scale scores were significantly predictive of help seeking in a bivariate test of mixed gender samples ( $r=0.39$ ,  $p<0.001$ ,  $n=154$ ). Internal consistency was acceptable ( $\alpha=0.79$ ), for this measure in the present study.

The *Personal Perspectives Questionnaire* (PPQ) was developed specifically for this study. It consists of 8 items designed to rapidly assess broad indices of mental health literacy (“Do you know of any effective treatments for phobias?”) and also elicit specific information (e.g., “How old were you when you first felt afraid of needles?”) for use in personalizing the intervention content.

The post-intervention assessment consisted of the ATSPPH-short form and TMQ described above as well as the Direct Solicitation item and Satisfaction Survey:

*Direct Solicitation:* In order to more objectively measure help-seeking behavior, one item directly solicited a help seeking behavioral response. In this item participants were invited to either (1) to receive free literature on effective self-help strategies to manage unwanted BII phobia symptoms; (2) to participate in a phone intake at the UCONN Department of Psychology’s training clinic; (3) both options 1 and 2; or (4) none of the above.

The *Satisfaction Survey* is a study specific form that contains 20-items designed to assess both the acceptability of the intervention (“How useful did you find the activity you completed?”) and the fidelity of the interventionist to MI principles (“How caring was the person you met with?”) with responses given using a likert scale. Open ended questions were used to permit the collection of more individualized responses phenomenological content to guide development of future iterations.

The one-month follow up survey contained the same assessment content as the post-intervention survey, omitting the Satisfaction Survey. In addition, the follow up survey contained the Help Seeking Behaviors Questionnaire.

The *Help Seeking Behaviors Questionnaire* is a brief survey that was developed specifically for this study. It was designed to assess for different kinds of help seeking behaviors over a discrete time period, including both informal (e.g., internet searches, talking with friends) and formal (phoning a clinic, entering treatment) behaviors.

### *Intervention Content*

The content of the proposed intervention will have multiple active components designed to (1) increase mental health literacy; (2) reduce stigma; and (3) promote engagement in help seeking behavior. The intervention to be developed will consist of four modules with the following specific content areas:

1. *Information normalizing the experience of clinically significant anxiety, including BII-phobia.* This module will provide data on national and university-level prevalence rates for anxiety disorders including BII-phobia. The goal of sharing objective data on a higher than expected prevalence of anxiety will be to promote mental health literacy and correct participants' cognitive distortions of being alone or unusual (deviant) in their experience of anxiety, and thereby mitigate stigma.
2. *Psycho-education on the physiology of anxiety.* This "anxiety and the brain" module will provide a brief discussion of the neural pathways implicated in the stress response. It will also describe how these function within the context of anxiety generally and specific phobia in particular, with attention to the physiological signs and symptoms that are familiar to the participant. By providing the biological basis for this psychological phenomenon, this section

seeks to combat self-stigma of the “weak not sick” type described in the literature (Yap et al., 2013).

3. *Exploring the consequences of avoidance.* This module will elicit from the participant possible negative outcomes associated with not attending regular medical exams, vaccinations, obtaining blood tests, awkwardness at the blood drive, etc. The goal of attending to these short and long term consequences is to address participants’ risk minimization through risk sensitization and develop discrepancy (Miller & Rollnick, 2012).
4. *Explore anxiety treatment approaches.* This module will provide information about empirically supported treatments for specific phobia generally and the unique symptoms of BII-phobia (i.e., syncope). This section will include descriptions of interventions and data on success rates. The discussion will encourage the participant to rank treatment options in order of preference to explore the pros and cons of personally undergoing specific treatments. This module is designed to enhance mental health literacy and promote trust in treatment efficacy and provider competency.

The final module concluded with the interventionist sharing information on services that are available to the participant locally. Discussion will encourage development of a behavior plan of when and how the individual might initiate treatment.

#### *Intervention Process*

The process dimension (i.e., the “how” of content delivery) is in itself an important active ingredient of the intervention and will rely on two main elements:

1. *Personalized feedback.* Whenever possible, intervention content will be given in the context of participants' previously held beliefs. Portions of participants' pre-assessment results will be available to interventionist to individually personalize the intervention and promote discrepancy. For example, in the pre-intervention assessment participants will be asked, "On a scale of zero to 100 percent, what percentage of university students do you believe get dizzy or pass out during medical procedures involving needles?" When introducing the corresponding section of the intervention, the interventionists used participants' responses to provide a comparison of the believed vs. actual numbers and elicit participants' reactions to any discrepancy or correspondence that is observed between the two values.
2. *Motivational Interviewing.* When executed faithfully, Motivational Interviewing (MI) can promote change by resolving ambivalence. This style of intervention is rooted in a spirit of collaboration, and is grounded in respect for participants' autonomy and self-determination (Miller & Rollnick, 2002). Interventionists were not clinicians; rather, three university undergraduates (i.e., peers) with a stated interest in the subject matter volunteered for a two semester placement in the lab where this study was housed. The graduate student researcher-clinician coordinating the study provided training in MI techniques and "spirit" in which these are executed (Miller & Rollnick, 2012). Training took place over 2 months and included: brief seminar style lectures; worksheet exercises; interactive role play; familiarization to the treatment manual; and individual recorded practice sessions using "participant" models that were reviewed and critiqued in a group

format. Throughout the data collection period, the research team held an ongoing weekly supervision to promote ongoing acquisition of MI skills and to process any individual situations not specifically addressed in training.

### *Control Condition*

Participants randomly assigned to the control condition completed brief self-study from a brochure about specific phobias. This brochure is produced by the Anxiety and Depression Association of America, and is available as a .pdf file through the Student Health Services website at UCONN. Thus, the control condition provides informational content matched to the intervention without any of the supportive or relational components inherent in MI. It was chosen to reflect the “standard of care” in promoting help seeking.

### *Sample Size and Data Analysis*

For this pilot test of a novel intervention, we sought a sample size of 60 participants (30 per cell). Using the software G\*Power (Faul, Erdfelder, Lang, & Buchner, 2007) we determined that for most mean and variance comparisons, and assuming medium (Cohen’s  $d=.5$ ) effect sizes, a sample size of 60 would yield 60-65% power. This is below the proposed standard of 80% power for behavioral science but greater than the average power (50%) found among published studies in psychology generally (Maxwell, 2004).

All analyses used either the software SPSS version 20.0 (IBM Corp., 2011) or R 3.01 (R Core Team, 2014) as indicated. All outcomes of interest were analyzed descriptively and tested for maintenance of statistical assumptions prior to hypothesis testing. In order to limit bias by missing data of those lost to follow up at one month, an

intent to treat analysis was used. When a participant failed to respond to requests for follow up assessment, ratings from the antecedent time point (in this case the post-procedures assessment) were used as an estimate.

Any smaller pilot study using convenience sampling raises the specter of sampling bias. In order to assess the risk of this in the present study, important demographic and clinical variables were compared between (1) the university population, represented by those students completing the prescreening questionnaires; (2) the sampling frame of students who met inclusion criteria; and (3) the study sample. Descriptive statistics were generated to compare all variables of interest and the appropriate statistics (*t* or *F* tests for continuous variables;  $X^2$  or Fisher's Exact tests for categorical data) assessed for the presence or absence of differences and thereby determine to the degree of possible sampling bias present.

In order to assess for the presence of confounds between groups, characteristics of intervention and comparison groups were compared for using *t*-tests for continuous variables and chi-square tests for categorical data. For the same reason, covariates were assessed for their independent effects on all outcomes of interest. Any significant ( $p < 0.05$ ) relationships were entered as covariates in subsequent analyses automatically. Given the small sample size and high likelihood that even medium size (Cohen's  $d = .5$ ) differences might not meet this threshold, additional covariates empirically supported by SDT theory were also considered in multivariate analyses.

We used longitudinal between groups analyses on continuous outcomes of interest. Mean comparisons will provide information on the intervention's effect on continuous variables. These included 2 (groups)-by-3 (time point) repeated measures

ANCOVA, with post-hoc comparisons of estimated marginal means and associated confidence intervals. Analyses involving mean comparisons will also include estimates of effect size (Cohen's *d*) in order to inform beyond statistical hypothesis inference testing.

Behavioral outcome data are operationalized as cumulative counts (e.g., frequencies of help seeking behaviors) and compared using Fisher's Exact Test to assess for any intervention effect. We would expect these data to exhibit a sufficiently large positive skew to contraindicate the use of standard parametric testing (e.g., ANOVA) that assumes some approximation of a standard normal distribution in dependent variables. Such approaches (e.g., OLS regression) with count data typically underestimate the actual strength of the relationship among variables; instead, Poisson regression is an established analytic strategy for these data (Coxe, West, & Aiken, 2009; Gardner, Mulvey, & Shaw, 1995). Poisson also offers an advantage over Fisher's test in that it permits multivariate analysis controlling for any found covariates. Exponentiation of regression coefficients and calculation of incident ratios (IR) enhances interpretability of the data.

Finally, descriptive outcomes related to participant satisfaction and interventionist ratings were assessed to check for any inconsistencies among interventionists and to determine the acceptability of the intervention overall.

## **Results**

### *Study 1: Formative Elicitation*

#### *Participant Demographics: Assessing Risk of Sampling Bias*

Approximately one in five (21.4%) members of the population met inclusion criteria for this study. From this sampling frame, 7.1 percent ( $n=30$ ) participated in study procedures. Sample characteristics can be found in Table 1. The sample did not differ in

either age ( $t=-.447$ ;  $p=.655$ ), socio-economic status (SES) ( $t=-1.684$ ;  $p=.103$ ), U.S. citizenship at birth ( $X^2=.941$ ;  $p=.332$ ), or gender ( $X^2=.365$ ;  $p=.833$ ) from the general population. The sample displayed a more equal gender distribution than that of the sampling frame ( $X^2=5.499$ ;  $p=.019$ ), and showed greater racial/ethnic diversity than both the general population ( $X^2=7.305$ ;  $p=.007$ ) and the sampling frame ( $X^2=8.004$ ;  $p=.005$ ).

Clinically, the sample endorsed significantly higher levels of needle anxiety than the general population, as operationalized by IPSA score ( $t=-3.852$ ;  $p<.001$ ). Importantly, the sample mean IPSA score did not differ significantly from that of the sampling frame ( $t=-.831$ ;  $p=.406$ ). All of this suggests that TAGS-1 data carries a minimal risk of sampling bias. We were fortunate to recruit minority participants in proportions greater than those found in the population, though this was not an explicit goal of the study.

#### *Coding and Content Analysis*

Research assistants successfully recorded audio from all sessions without technical difficulties. Staff transcribed these and regular random quality checks of transcripts revealed no inaccuracies. The resulting 87,598-word data frame can be considered a valid representation of the total verbal content emanating from this study. Content analysis was guided by themes identified through the coding form. Coding revealed a pattern of responses to key questions.

In describing their experiences undergoing standard routine medical procedures, participants endorsed high levels of dangerousness and disgustingness. The keyword “gross” was used 30 times in participant descriptions of undergoing venipuncture as in, “It’s like a gross feeling...in my arm (Participant 100),” and, “I just can’t do the IVs, that’s just my one thing. It just grosses me out (Participant 102),” and, “if you were

getting blood taken, I know that they take like, a pint or something like that, like, a good amount. So, you just have to see it come out, and like, that's gross I think. Like, not only scary, but just like gross (Participant 113)."

Shame and embarrassment were observed a majority (66%) of coded sessions, typified by the following exchange about avoiding blood donation.

Participant 114: I don't want to faint so I don't want to draw [*sic*] blood.  
 Interviewer: Okay, well, what do you feel in that situation? Do you feel anything?  
 Participant 114: Kind of ashamed that I couldn't do it. It's for a good cause, but I'm just being a baby about it.

Self-shaming reactions were also noted in participants' reflections on situations where they followed through with a procedure, "I was getting blood tests once and I just hated it...I just like freaked out too much and I didn't like pass out but I got super queasy and like light headed and I don't know I was being a baby I guess (Participant 100)."

Content analysis also revealed significant deficits in mental health literacy. In spite of reporting significant avoidance of and functional impairments in situations involving blood and needles, most (87.5%) respondents did not consider their symptoms clinically significant. The following exchange during a focus group exemplifies this attitude:

Participant 108: I feel like I'm not at that level where I need like counseling...  
 Participant 109: Yeah  
 Participant 108: My anxiety only lasts for so long, it's not like I think about it like every day.  
 Interviewer: Does anyone feel similarly or differently?  
 Participant 109: Yeah I really only think about it when I have to, like, go through something but like on a normal day? No.  
 Participant 108: It's not crippling.  
 Participant 109: I think it's definitely a lot of like psychologically like what you're thinking because my brother he was the same way that I was and then like after college he went to the army where they have to give IVs on each other and like he got over it and he was like 'it's just psychological: you can get over it'...  
 Participant 107: I feel the same.

From the above consensus, typical of focus group data, we see dual phenomena at work. By successfully avoiding phobic situations, participants reduce their distress allowing problem and risk minimization. This coincides in the above quote with a report of spontaneous remission of symptoms that obviates the need for professional treatment. There is even the implication in the above that because something is psychological, it needs to be taken care of alone. This is interesting when one considers that when asked, only one (3.3%) participant reported any awareness of treatment for BII phobia symptoms. A current desire to avoid was almost uniformly endorsed. Parental involvement was the greatest predictor of participants' undergoing a procedure. In a hypothetical scenario depicting a friend's request to have the participant participate in an upcoming blood drive, most (75%) stated they would disclose their fear to a peer.

After treatment was briefly explained, we assessed participants' enthusiasm for personally undergoing treatment. Attitudes were largely negative with 63.3% ( $n=19$ ) opposed to seeking treatment, 23.3% ( $n=7$ ) reporting ambivalence, and only 13.3% ( $n=4$ ) enthusiastic. While most identified reduced anxiety and increased ability to function as potential benefits of treatment, half reported stigma of professional help seeking as a barrier to treatment and most (87.5%) did not consider missed medical appointments to be a risky health behavior. Thus we observed behavioral avoidance served to assist these individuals in managing their fear through reducing their exposure to fearful situations. At the same time, low health literacy, risk minimization, stigma, and a preference for informal or "self-help" solutions each present formidable barriers to individuals considering initiating treatment for this phobia. In general, content analysis of our

university student sample revealed a set of themes that are congruent with those observed in both the BII phobia and the help seeking in young people literatures.

### *Participant Satisfaction*

In order to predict the potential acceptability of a future intervention, we assessed participants' satisfaction with the peer delivered, discussion-based format of the TAGS-1 interviews and focus groups. Overall satisfaction was very high for this study, with 93.3% of respondents ( $n=28$ ) describing their "overall experience of the discussion" as positive (33.3%) or very positive (60.0%); two participants endorsed a neutral impression. In addition, participants were nearly uniform in their approval of the peer facilitators; when queried, 96.7% endorsed feeling "like the facilitator was really listening and cared" about their responses to questions. Reactions to the discussion of feared stimuli itself were more mixed. A full third of respondents ( $n=10$ ) agreed with the statement, "It was not easy to manage my anxiety about blood and needles during my discussion." This was echoed in the open ended feedback as well; the nine respondents (30%) who described aspects of the study they disliked referred explicitly to the process of talking about medical procedures and anxiety itself, "There was nothing I disliked besides thinking about getting shots (participant 110)." This speaks to the aversive nature of phobic stimuli and the challenge in designing interventions to promote help seeking when that help involves exposure.

### *Study 2: Intervention Testing*

#### *Participant Demographics: Assessing Risk of Sampling Bias*

Approximately 7% ( $n=216$ ) of the population ( $n=3,042$ ) met inclusion criteria for this study. From this sampling frame, 27.8% percent ( $n=61$ ) volunteered to participate.

Sample characteristics can be found in Table 2. The sample did not differ in either age ( $t=-1.546$ ;  $p=.122$ ), SES ( $t=-1.082$ ;  $p=.279$ ), race/ethnicity ( $X^2=1.857$ ;  $p=.173$ ), U.S. citizenship at birth ( $X^2=.941$ ;  $p=.332$ ), or gender ( $X^2=.667$ ;  $p=.414$ ) from the general population. Similarly, the sample did not differ from the sampling frame in age ( $t=.1049$ ;  $p=.296$ ), SES ( $t=.083$ ;  $p=.934$ ), race/ethnicity ( $X^2=.032$ ;  $p=.858$ ), or U.S. citizenship at birth ( $X^2=.118$ ;  $p=.732$ ). The sample displayed a more equal gender distribution than that of the sampling frame ( $X^2=10.530$ ;  $p=.001$ ).

Clinically, the sample endorsed significantly higher levels of needle anxiety as operationalized by mean IPSA score ( $t=-6.544$ ;  $p<.001$ ). In addition, individuals in the study sample were significantly more likely to report dizziness or fainting during medical procedures ( $X^2=45.790$ ;  $p<.001$ ) than the general population. Importantly, neither mean IPSA score ( $t=-1.086$ ;  $p=.281$ ) nor the likelihood of reporting a current history of dizziness or fainting during medical procedures ( $X^2=.149$ ;  $p=.700$ ) differed significantly between the sample and the sampling frame. No differences were observed in study sample's prior use of professional mental health services and use among either the general population ( $X^2=.008$ ;  $p=.928$ ) or the sampling frame ( $X^2=.099$ ;  $p=.753$ ). All of this suggests that TAGS-2 data carries a minimal risk of sampling bias. We were fortunate to recruit a more gender equal sample than that found in the sampling frame, though this was not an explicit goal.

#### *Assessing Effectiveness of Randomization Scheme*

Participants were randomized to either the MI intervention ( $n=31$ ) or the informational control ( $n=30$ ) conditions. Table 3 lists data for the important demographic and clinical characteristics of each group as well as for the overall sample.

Randomization was successful with mean differences by group not significantly different ( $p \geq .05$ ) across all baseline psychosocial variables, prior mental health treatment history, gender, and ethnicity. The variable of age provided the only exception, with the mean age of the intervention group greater than the control group by six months ( $t=-2.037$ ;  $p=.046$ ). As a result, the variable of age was added to the covariates used in subsequent multivariate analyses.

### *Outcomes*

#### *Changes in Continuous Measures of Attitude and Motivation*

First, we assessed for changes in measures of attitude towards seeking professional mental health treatment (ATSPPH-short form), immediately before and after study procedures, and at one month after procedures. An intent to treat analysis using repeated measures ANCOVA controlling for age revealed no overall effect of time on average scores of this measure ( $F(1,59)=.159$ ,  $p=.692$ ) and no time by group interaction ( $F(1,59)=.227$ ,  $p=.601$ ). Between groups differences were also not statistically significant ( $F(1, 59) = .560$ ,  $p=.457$ ). Scores were higher in the control group than in the intervention group, with a medium to large effect size observed both pre and post study procedures (Table 4). In the one month follow up this difference is noticeably attenuated, with a small effect size difference continuing to favor the control group (Figure 2).

In addition, we analyzed self-reported data on motivation to seek professional help using the motivation for help-seeking subscale of the TMQ measure adapted for this study. Testing again relied on intent to treat analysis using repeated measures ANCOVA controlling for age. Results indicated an overall effect of time on average scores ( $F(1, 59) = 4.910$ ,  $p=.01$ ) and a time by group interaction ( $F(1, 59) = 3.881$ ,  $p=.03$ ). Between

groups effects did not meet threshold for statistical significance ( $F(1,59)=1.370, p=.25$ ), however a trend analysis using effect size estimates reveals the nature of change over time and across groups (Table 4). The control condition exhibited a larger mean motivation score at baseline, with medium to large standardized mean differences present. The repeat assessment after study procedures reveals marked attenuation of this difference that is maintained at one month follow up. (Figure 3).

### *Differences in Help Seeking Behavior by Group Assignment*

#### *Univariate Analyses*

Behavioral outcomes for this investigation include: (1) a direct solicitation to engage in help seeking behavior, and (2) a self-report of help seeking behavior over the last 30 days. Table 5 compares these outcomes by type and group assignment. Univariate count data analyses of individual behaviors using Fisher's Exact Test failed to reveal significant differences in either the solicitation ( $df=3$ ; value=2.093;  $p=.553$ ) or the self-report ( $df=3$ ; 3.797;  $p=.284$ ); however, participants were able to report the cumulative number of help seeking behaviors they enacted. When assessed, again using Fisher's Exact Test, a significant difference was observed ( $DF=3$ ; value=9.218;  $p=.026$ ) with the intervention group favoring a higher number of reported behaviors (Table 5). Multivariate modeling sought to examine this apparent difference more closely.

#### *Multivariate Analyses*

Response to solicitation and self-report data were operationalized as a cumulative count in each study participant. The resultant distributions exhibited significant positive skew, confirming the need for non-standard parametric analysis. Poisson regression of

these outcomes on group assignment again used the covariate of age (previously found to be significantly different across groups) as well as two variables (help-seeking motivation and intrinsic motivation) derived from SDT theory and assessed in the baseline questionnaire battery.

The direct solicitation outcome model (Table 6) exhibited good fit ( $X^2=55.10$ ;  $DF=50$ ) to the Poisson distribution and revealed a strong intervention effect on the number of help seeking behaviors observed per individual. When solicited, an individual receiving the intervention responded positively more than two and a half times as frequently as those receiving information alone ( $IR=2.65$ ;  $95\%CI=1.14, 6.16$ ;  $p=.024$ ). The model of self-reported help seeking behavior (Table 7) also exhibited reasonable fit ( $X^2=68.97$ ;  $df=50$ ) and revealed a strong intervention effect on the number of help seeking behaviors observed per individual, with an individual's likelihood of engaging in a help seeking behavior 138% higher among individuals receiving the intervention, relative to those receiving information alone ( $IR=2.38$ ;  $95\%CI=1.10, 5.13$ ;  $p=.027$ ). A combined model of all behavioral outcomes retained reasonable fit ( $X^2=68.97$ ;  $df=50$ ) and again demonstrated a robust effect of the intervention (Table 8), predicting that an individual receiving the intervention will engage in almost two and a half times as many help seeking behaviors (Figure 4) as an individual receiving information only ( $IR=2.46$ ;  $95\%CI=1.40, 4.35$ ;  $p=.002$ ).

The resulting models showed good fit with the Poisson distribution and after controlling for baseline differences in age and motivation, revealed a strong effect of the intervention on both response to solicitation and reported help seeking behaviors at one

month after participation. Effect size estimates reflect medium strength differences ( $d=.51-.58$ ) across groups.

### *Participant Satisfaction*

To assess the acceptability of this newly piloted intervention, participants completed a satisfaction questionnaire identical to that which was used in TAGS-1. Overall satisfaction with the intervention was high for this study, with 80% of respondents ( $n=25$ ) describing their “overall experience of the discussion” as positive (13.3%) or very positive (66.7%); six participants (20%) endorsed a neutral impression. Moreover, majority proportions of participants strongly endorsed the intervention as “relaxed” (63.3%), “safe” (80.0%), and “comfortable” (56.7%). A high proportion of participants found the intervention informative (36.7%) or very informative (50.0%), while a similar majority rated the intervention as “interesting” (33.3%) or “very interesting” (33.3%). A large proportion of respondents found the intervention either somewhat (13.3%), pretty (33.3%), or very (30.0%) helpful. A majority (76.6%) agreed with the statement “I would definitely recommend the [intervention] to other people.”

Participants also expressed approval of the peer interventionists, with a majority strongly endorsing descriptors like “warm” (53.3%), “helpful” (73.3%), “likeable” (73.3%), “understanding” (83.3%), and “caring” (63.3%). Compared to the satisfaction of the control group, average ratings were higher among participants randomized to the intervention condition; effect size calculations indicate small to medium size effects of the intervention on participant satisfaction (Table 10).

### *Interventionist Ratings*

Three research staff members were trained to carry out the brief motivational interview. They provided self-report data on each intervention they conducted. The average duration of study procedures was 71.25 minutes ( $SD=23.6$ ); this did not vary significantly by interventionist ( $F=.654$ ;  $p=.524$ ). Using a seven-point Likert scale anchored with “1=poor” and “7=excellent”, staff rated both their fidelity to the manual (content) and their maintenance of a motivational interviewing style (process). They also rated attributes of the participant such as engagement in the discussion, problem recognition, and commitment to seek help. Table 6 lists these results, which show a general tendency toward interventionist ranking themselves as average while describing participant attributes slightly lower than average. The fairly large standard deviations associated with these variables suggest meaningful variation among individual cases. Analyses using one-way ANOVA assessed the extent to which this variation could be accounted for by the interventionist providing the rating. With only one exception, the interventionists did not constitute a significant factor in the observed variances. One interventionist assessed a single item (participants’ problem recognition related to avoiding medical procedures) significantly lower than the other two research staff members ( $p<.047$ ).

## **Discussion**

### *Purpose of the Present Study*

Avoidance of the feared stimuli is a core criterion of phobia and in the case of Blood, Injection, Injury Phobia this can lead to increased risk for suboptimal health outcomes (Jahnke, 2012; Wright et al., 2009; Yim, 2006). Population estimates suggest

that anywhere from 1-in-10 to as many as 1-in-5 individuals avoids routine medical testing or intervention because of fear, and epidemiological data indicates that avoidance begins in adolescence (Alegria et al., 2007; Barlow, 2002) making emerging adulthood the primary developmental context for risk. Although effective treatment exists (Ayala et al., 2009; Patel et al., 2005), engagement in care is low among young people (Hunt & Eisenburg, 2010). Individuals typically keep their distress to themselves or rely on informal help (i.e., friends, family) to cope with mental health difficulties; moreover, the general public exhibits deficits in mental health literacy and expresses concerns with stigma around seeking treatment (Biddle et al., 2007; Reavley et al., 2012; Yap et al., 2013). While efforts have been made to promote help seeking for mental health issues generally among young people, these have been reserved for large-scale informational campaigns targeting a general population (Gulliver et al., 2012a). Moreover, investigations often examined attitudes and intentions in favor of behavior as an outcome of interest and were not theoretically based. While researchers report significant effects on these cognitive processes, the size of the effect is small. The potential for a more personalized, one-on-one approach to evince change, particularly behavioral change, is less understood. The constructs of Self-Determination Theory offer a useful framework and Motivational Interviewing an established mechanism for designing and testing a brief intervention to promote help seeking.

In our study we sought to examine help seeking in the context of a specific psychological difficulty (e.g., fear of blood and needles) and were particularly interested in investigating whether a newly developed brief motivational interview, delivered by peer facilitators, could promote help seeking beyond the effects of information alone. To

our knowledge, this study is the first to investigate help seeking for BII phobia symptoms in young people using MI; as such, a first aim of the study was to conduct formative elicitation research to investigate whether themes of phobic avoidance and barriers to help seeking were consistent with those observed elsewhere. This permitted the development of relevant content for delivery via the brief peer-delivered interview. The primary aim of this study was to explore the effect of the intervention on help seeking behavior, relative to control. Related aims sought to assess the intervention's impact on attitudes and motivation for help seeking, particularly engagement in therapy with a professional. Given the areas of growth present in the current evidence base, we feel that these aims offer substantive innovations and important additions to the body of existing interventions to promote help seeking behavior.

*Study 1: Impact of Thematic Analysis and Satisfaction Data on Subsequent Intervention*

Though it was not specifically designed to do so, this formative elicitation study was fortunate to recruit a sample with ethnic and gender parity superior to that of the population or the sampling frame (Table 3). This put many questions of sampling bias to rest, and permitted an examination of thematic content that can be deemed somewhat more trustworthy than if our sample had been comprised of proportionately more Caucasian, more affluent, and/or more male members than the university student population at large.

*Hypothesis 1*

The results of the study supported our hypothesis, demonstrating consistency with themes found within the literature base generally including: low mental health literacy and the presence of self-stigma (“weak not sick”) with associated shame. Mental health

literacy in this study was operationalized as whether individuals accurately identify problems as clinically relevant and their knowledge of empirically supported treatments. By these criteria, mental health literacy was quite low: the vast majority of participants engaged in problem minimization and all but one were entirely ignorant of treatment options for phobia. This provided a confirmation that any intervention needed to contain some educational component to redress this gap.

Coders found self-shaming and stigmatizing content in two thirds of sessions. Text analysis yielded keywords (e.g., “baby”) that linked to feelings of self-stigma or shame. This is important particularly in the participants’ developmental context of emerging adulthood. To characterize their fears as “babyish” suggests a belief that their anxiety is incompatible with becoming an adult. What comes of this is not clear. Guided by SDT, one could posit that whether this belief leads to engagement in care to treat their anxiety or shameful concealment may depend first on the individual’s trait level of intrinsic motivation for change. SDT would also predict that the likely result is also dependent on the social-environmental context (“state”) of that individual, with caring environments favor the individual’s autonomous expression of competence more likely to engender help seeking (Ryan & Deci, 2000). This suggested that our intervention needed to respond to possible self-stigma and shame in participants.

Lastly, participants were nearly uniform in their strong appreciation of the interview format. Many suggested that having the opportunity to discuss their experiences and learn new information was valuable to them. While this lent overall credence our use of an interview style like MI to carry out the intervention, there was also a note of caution in the data. Anxiety seemed to act on satisfaction, such that individuals

with the highest levels of anxiety were activated by the discussion itself and were less supportive of the format. All of these findings, along with SDT theory helped us design an intervention with what we hoped would be appropriate content and an effective presentation style.

### *Study 2: Intervention Testing*

As in Study 1, it was important to first address concerns about sampling bias in this small pilot study. Fortunately, the study sample did not differ in ways that increase risk of bias. Though we did not design our recruitment scheme to this end, we again were fortunate to recruit a sample with greater gender equity than the sampling frame. It was unusual to find a preponderance of female members in the sampling frame. While it is true that females will typically outnumber males in anxiety disorder prevalence by a factor of 2:1, it is also known that gender distribution for BII phobia is closer to 1:1 (Barlow, 2002; APA, 2013). One theory to explain this difference suggests it is rooted in evolutionary pressure for a male syncopal phenotype stemming from Paleolithic warfare practices (Bracha, Bienvenu, & Eaton, 2007). While the etiology of this disorder might remain unclear, we were fortunate to recruit a sample more consistent with the epidemiology of this disorder. Testing for differences among the population, the sampling frame, and the sample yielded two factors supporting the conclusion that a low risk of bias was present. First, as in Study 1, key demographic variables did not significantly differ suggesting that our sample was not ethnically or economically different from the sampling frame or the university student population from which the sample was taken. Conversely, both sampling frame and sample did differ from the population in their experience of anxiety, with needle anxiety scores that were

significantly higher. This provides evidence for validity in that we can reasonably assert that the people in the sample had the attributes we hoped to study. Lastly, there was an absence of meaningful differences in anxiety between the sampling frame and the sample. This is important in light of the finding in Study 1 that some participants with higher levels of anxiety found the semi-structured interview and its discussion of phobic stimuli to be onerous. There was a risk that individuals with the highest levels of anxiety would not willingly opt in to a study focused on discussing the role their fears have played in their lives. Fortunately, this was not the case. These data support an assertion that a low risk of sampling bias was present in the recruitment of participants for intervention testing.

### *Hypothesis 2*

Participants completed a measure of attitude toward professional help seeking: the Attitudes toward Seeking Professional Psychological Help-short form (ATSPPH; Fischer & Farina, 1995). Participants completed this measure at baseline, after study procedures, and at one month after procedures. We hypothesized that individuals receiving the intervention would show higher scores after completing study procedures than those randomized to control conditions. The data when tested supported a null hypothesis with no statistically significant differences observed. In a small-scale pilot test with suboptimal statistical power, a secondary examination of effect size differences provides us with more information (Maxwell, 2004). At baseline, the control group endorsed a more positive view of professional help seeking, exhibiting a medium effect size ( $d = .61$ ). Both groups reported more positive attitudes toward professional help seeking after completing study procedures, sustaining the effect size difference between groups ( $d =$

.71). At this point, the size of the effect across groups appears nearly identical. At one month follow up, however, the two groups diverge: the experimental group maintains its elevated score while the control group regresses halfway back to its baseline score, and substantially reducing the difference between groups from medium to small ( $d = -.36$ ). One possible explanation for this is regression to the mean (Nesselroade, Stigler, & Baltes, 1980). This is perennial risk in measuring change using repeated measures where initial extreme scores are less extreme upon repeat assessment. Another possibility is that the motivational interview process had a more sustained effect on participants' attitude than an information only condition. Consistent with self-determination theory, the intervention sought to support participants' autonomy while instilling a sense of competence and personal efficacy. This may have led to sustained attitudinal change, whereas exposure to information only led to transient change. While not inconceivable, this is nonetheless a speculative interpretation of changes in attitude within and between groups.

### *Hypothesis 3*

As part of study procedures, participants also completed a measure of motivation for help-seeking consistent with SDT constructs of extrinsic motivation and intrinsic motivation: the Treatment Motivation Questionnaire (TMQ; Ryan, Plant, & O'Malley, 1995). Participants completed this measure at baseline, after study procedures, and at one month after procedures. We hypothesized that the intervention group would report higher scores immediately after and at one month after study procedures, compared to the control group. Results supported the null hypothesis: mean scores of motivation for help seeking were not significantly different across groups. However upon closer examination,

these data assumed a pattern consistent with the data on attitudes toward professional help seeking.

Analyses showed a significant effect of time was present, as well as a significant time by group interaction. This suggests that both groups changed over time and they changed in different ways. Participants allocated to the control condition reported higher motivation for help seeking at baseline than those randomized to the intervention with a medium effect size difference ( $d=-.56$ ). Both groups reported increased motivation for help seeking immediately after completing study procedures, sustaining the effect size for the mean difference ( $d=-.47$ ). At one-month follow up, enhanced motivation was maintained in the intervention group while similar gains attenuated in the control group: this halved the difference between groups ( $d=-.23$ ). Given this similar pattern, this time with statistically significant effects, we may consider the same interpretations in regards to the motivation scale as we considered in the attitudes measure. Again, it may be that baseline differences and regression to the mean are driving the observed group by time interaction. Another interpretation is that the intervention effected change. Though not different in magnitude of change relative to the comparison condition, the MI intervention may have provided the essential “nutriments” (Ryan & Deci, 2000) to promote more internalization of motivation. In accordance with SDT, motivations that are more internalized are more consistent and durable over time (Deci & Ryan, 1985; Ryan & Deci, 2002) leading to more frequent help seeking behavior.

*Hypothesis 4*

We collected data on help seeking behavior in two ways: through participant report at one month follow up assessment and through participant response to direct solicitations offering help after completion of study procedures. We hypothesized that participants randomized to the brief motivational interview would report more occurrences of help seeking behavior and be more likely to respond to the direct solicitation than those participants assigned to an information only control condition. The results supported this alternate hypothesis, with the intervention group reporting higher behavioral counts of help seeking and a greater likelihood of responding positively to the direct solicitation than the control group. Moreover, this effect was sustained in multivariate analyses controlling for covariates and effect sizes ( $d=.51-58$ ) observed in this study exceeded the median for MI interventions targeting health behavior change (Burke et al., 2003; Cushing et al., 2014; Gayes & Steele, 2014; Jensen et al., 2011) and studies to promote help seeking among emerging adults (Gulliver et al., 2012a).

For individuals with BII phobia symptoms, avoidance is an extremely effective anxiety management tool. Help seeking behavior, by directing conscious attention toward the feared stimulus, effectively rips that protection away. In the absence of practiced stress management strategies, this necessarily increases discomfort and anxiety. As such, any contemplation of help seeking behavior should be met with ambivalence in this population. Information is a powerful tool to increase awareness and address gaps in mental health literacy; as observed earlier, information alone was sufficient to boost participant responses in attitude and motivation measures. Motivational Interviewing helps people change by establishing the necessary preconditions for processing

ambivalence around change. This newly developed intervention saw significant changes in participant behavior immediately after and at one month after study procedures. Where behavior was concerned, information alone did not appear sufficient to match the intervention effect.

### *Hypothesis 5*

Participants were asked to rate their impressions of (1) intervention content and (2) their interpersonal process with the peer-facilitator. We hypothesized that a majority of participants would report a positive experience and endorse the intervention as acceptable. Results supported this hypothesis. Majority proportions endorsed the content as informative, interesting and helpful; while describing their experience of the peer-facilitator as warm, helpful, understanding, and caring. Content was designed to be relevant to the experience of an individual with BII phobia symptoms and was informed by theory, literature, and our own formative elicitation work. Moreover, the process of MI supports autonomy, self-efficacy, and conveys competence through the open, empathetic, and non-judgmental stance of the interventionist. The resulting sense of relatedness (Markland et al., 2005) is largely inoffensive to most that experience it.

In sum, our results support the assertion that a brief, peer-delivered motivational interview can promote help seeking behavior in a sample of emerging adult university students experiencing BII phobia symptoms. This intervention also may support more sustained changes in attitude and motivation toward help seeking, though unlike behavior, these measures were not significantly different from the levels observed in the control condition. Equivocal impact on attitude and motivation notwithstanding, the

medium strength effect on behavior exceeded the mean effect size typically observed in studies of this type and was sustained at the one month follow up reassessment.

### *Limitations*

While the studies herein possess many strengths, including a randomized controlled trial design, there are also certain important limitations to describe. Data collection relied exclusively on use of an undergraduate student participant pool. This opens the study to criticism that individuals who volunteered for this study felt coerced to participate based on their course requirements. The Belmont Report (U.S. Department of Health & Human Services, 1979) explicates 3 essential principles to govern ethical considerations surrounding human subjects of research. These are (1) respect for persons; (2) beneficence; and (3) justice. It is the first of these that may be called into question with research using a student “participant pool.” Respect for persons is based in individuals being treated as autonomous agents. It is not always clear if undergraduate students feel that they are autonomous agents in volunteering for research. The American Psychological Association has set a policy that students be given the choice of “equitable alternative activities” (American Psychological Association, 2010), such as writing a term paper, to reduce the risk of coercion. This was certainly the case in the university participant pool from which these studies’ samples were drawn. Moreover, the present study explicitly sought to examine the developmental frame of emerging adulthood, making use of the participant pool intentional and not merely a sample of convenience. What is less clear is if students generally perceive their use in research as voluntary or mandatory, and whether they see the alternatives as truly equitable or a sham comparison. Though ancillary to the research at hand, this should be an important area for continued

research in its own right. That said, the limitations of sampling a university student population persist: the findings here may not generalize to the majority of emerging adults not matriculated to university.

Study 2 was statistically underpowered to detect small or even medium size effects; this increases risk of Type II error where meaningful between groups differences do not meet the threshold of statistical significance and are therefore erroneously discarded. We sought to ameliorate this risk by conducting secondary analyses using a between groups measure of effect size: the standard mean difference (Cohen's *d*). Using effect sizes, we were able to both assess the magnitude of differences and track how these change across groups and over time in this longitudinal data set. While these efforts may somewhat mitigate its impact, low power impacted this study, reducing the strength with which we may proffer interpretations of these data, and is therefore a significant limitation.

Use of peers, rather than professionals or graduate student clinicians, to deliver the intervention may also have constituted a limitation of this work. Interventionists with strong clinical backgrounds are more likely to possess a foundation of core competencies (e.g., active listening) that facilitate their delivery of manual content and their execution of MI style. None of the three interventionists had any prior familiarity with or training in MI principles or techniques. We responded to our concerns about this through the use of a standard training model found in clinical training programs. By blending didactic modules with "hands on" exercises and providing ongoing supervision throughout their work, we believe we mitigated these deficits to the fullest extent possible, given the constraints of time and the clinical limitations of the graduate student supervisor. In

addition, the intervention manual contained scripts and prompts that were designed to maintain the “spirit” of MI (Miller & Rollnick, 2012). Moreover, given the literature suggesting that young people favor reaching out to friends over seeking professionals, it was our belief that peer-interventionists would promote relatedness, one of the essential “nutriments” of enhancing motivation for change (Ryan & Deci, 2000). These intentions aside, use of peers to deliver a sophisticated treatment such as MI begs the question to what extent the intervention process was consistent with MI practice and is therefore a limitation of the study.

While we intended the direct solicitation item to provide a more objective measure of behavior change, our study relied heavily on subjective measures to track all variables of interest. Such measures are subject to reporting and social desirability biases, constituting a further limitation of the study. Moreover, while this study tracked help-seeking behaviors, we did not collect information on the outcomes of those behaviors (i.e., whether individual’s felt helped, judged, supported, stigmatized, etc.). This absence of a direct link to participants’ perceptions is an additional limitation.

Formal help seeking and engagement in care is the ideal response to clinically significant anxiety, with informal modalities a less useful and potentially (depending on the knowledge and skill of the non-professional sought) undermining to the seeker (Biddle et al., 2007). Analyses did not find meaningful differences among individual behaviors across groups; only when considered *en masse* did a pattern of statistically significant differences emerge. Since people are capable of initiating multiple help seeking behaviors, it paints a fuller picture to consider the change in cumulative

behaviors. It is nonetheless a limitation of the study that a more fine-grained analysis was not possible in this small pilot study.

Lastly, this intervention sought to address a very specific clinical symptom: behavioral avoidance of medical situations secondary to fear of blood and needles. It is unclear if these findings would hold in a more general trial of anxiety, depression, or other psychological distress.

#### *Future Directions*

BII phobia is both very impairing and very treatable. Barriers to help-seeking persist in the general population. Emerging adulthood may be a fortuitous developmental context in which to deliver interventions designed to promote help-seeking. The current project outlines the development and initial testing of a single-session, theory based intervention to promote help-seeking behavior. While initial results may be cautiously characterized as positive. More work is needed to replicate and expand these findings. Future studies will require larger samples in order to achieve sufficient power and reduce risk of randomization errors resulting in baseline differences across groups. Multi-site studies that combine university and community samples would increase the external and ecological validity of any findings. It will be important to investigate whether designs more inclusive of multiple disorders but retaining the one-on-one, personalized format will have a similar effect. Studies incorporating multiple mental health clinics as partners could more objectively track the behavioral outcome of engagement in care.

Formal and informal help seeking are generally conceptualized as alternatives in a zero-sum game (Yap et al., 2013). This may be a forced dichotomy, as our research shows that a large proportion of participants expressed interest in both formal and

informal help. Research needs to explore the relationship between formal and informal help seeking in order to explicate any directionality or causality between them. In this way, researchers might develop effective ways to harness the greater initial attractiveness of informal help and use it as a bridge to engagement in professional care.

While endorsed cautiously by reason of its limitations, the findings of this study have implications for public health, in particular mental health utilization disparities among young people (Hunt & Eisenburg, 2010). Future research on brief motivational interviewing appears feasible, acceptable, and efficacious in this population and clinical context.

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Table 1: Talking About Getting Shots, Part 1 (TAGS-1) sample characteristics in relation to sampling frame and population.

Characteristic	Population ( <i>n</i> =1,982)	Sampling Frame ( <i>n</i> =424)	TAGS-1 Sample ( <i>n</i> =30)
Mean Age in Years (SD)	18.64(1.59)	18.57(1.54)	18.77(.94)
Female	58.5(1144)	70.5(299)	53.3(16) <sup>b</sup>
Ethnicity			
African American	7.6(150)	11.8(50)	36.7(11)
Asian/Asian American	8.6(171)	5.9(25)	3.3(1)
Caucasian	70.6(1400)	69.6(295)	46.7(14) <sup>a</sup>
Hispanic/Latino	.2(4)	.5(2)	3.3(1)
Middle Eastern	1.1(21)	.7(3)	0(0)
Native American/Alaska Native	.2(3)	0(0)	0(0)
Native Hawaiian/Pacific Islander	.3(5)	.5(2)	3.3(1)
Other	5.2(104)	5.0(21)	3.3(1)
Socioeconomic Status			
Lower	5.9(112)	6.8(29)	6.7(2)
Middle	81.7(1619)	80.4(341)	79.9(24)
Upper	12.4(241)	11.8(50)	13.4(4)
U.S. Born			
Yes	85.8(1701)	83.0(352)	80.0(24)
No	13.9(275)	17.0(72)	20.0(6)
History of Fainting			
Yes	29.6(586)	59.2(245)	100(30)
No	67.5(1337)	40.8(169)	0(0)
Mean Score, IPSA-short form (SD)	18.92(7.26)	25.00(7.04)	23.96(6.47) <sup>a</sup>

Note: Population is here defined as university students completing the prescreening battery. Sampling Frame consists of those members of the population reporting a lifetime occurrence of avoiding/delaying a medical procedure involving needles (including a flu shot). All results herein are reported as percentages (*n*) except where stated otherwise. Total *n* varies by item as some respondents chose not to answer every question. <sup>a</sup> Sample characteristic was significantly different from the general population. <sup>b</sup> Sample characteristic was significantly different from the sampling frame.

Table 2: Talking About Getting Shots, Part 2 (TAGS-2) sample characteristics in relation to sampling frame and population.

Characteristic	Population ( <i>n</i> =3,042)	Sampling Frame ( <i>n</i> =216)	TAGS-2 Sample ( <i>n</i> =61)
Mean Age in Years (SD)	18.64(1.80)	18.34(1.15)	18.64(.82)
Female	58.2(1770)	78.2(169)	63.3(38) <sup>b</sup>
Ethnicity			
African American	7.1(215)	3.7(8)	5.0(3)
Asian/Asian American	16.8(511)	14.4(31)	11.7(7)
Caucasian	70.4(2141)	78.2(169)	78.3(47)
Hispanic/Latino	9.6(293)	7.4(16)	10.0(6)
Middle Eastern	1.6(50)	2.3(5)	1.7(1)
Native American/Alaska Native	1.0(30)	1.4(3)	0(0)
Native Hawaiian/Pacific Islander	.5(16)	.5(1)	0(0)
Other	2.3(70)	1.9(4)	0(0)
Socioeconomic Status			
Lower	5.7(173)	3.7(8)	1.7(1)
Middle	83.9(2551)	88.0(190)	86.7(52)
Upper	8.8(267)	7.9(17)	10.0(6)
U.S. Born			
Yes	86.1(2619)	88.9(192)	91.7(55)
No	13.4(408)	10.6(23)	8.3(5)
Current History of Fainting			
Yes	14.1(428)	46.8(101)	45.0(27)
No	79.2(2410)	53.2(115)	51.7(31)
Mean Score, IPSA-short form (SD)	17.20(7.04)	24.79(6.86)	26.52(6.48) <sup>a</sup>

Note: Population is here defined as university students completing the prescreening battery. Sampling Frame consists of those members of the population reporting a history of avoiding/delaying a medical procedure involving needles (including a flu shot) in the last 12 months. All results herein are reported as percentages (*n*) except where stated otherwise. Total *n* varies by item as some respondents chose not to answer every question. Cell sizes (*n*) for Ethnicity total to greater than sample size as respondents designated all applicable ethnicities. <sup>a</sup> Sample characteristic was significantly different from the general population. <sup>b</sup> Sample characteristic was significantly different from the sampling frame.

Table 3: TAGS-2 sample characteristics\* by assignment to conditions.

Characteristic	Overall Sample ( <i>n</i> =61)	MI Intervention ( <i>n</i> =31)	Control ( <i>n</i> =30)	Comparison Statistic
Mean Age in Years (SD) <sup>a</sup>	18.64(.82)	18.97(1.08)	18.47(.819)	-2.037*
Female	63.3(38)	71.0(22)	63.3(19)	.403 <sup>a</sup>
Ethnicity				2.928 <sup>b</sup>
African American	5.0(3)	9.68(3)	0(0)	
Asian/Asian American	11.7(7)	16.13(5)	6.67(2)	
Caucasian	78.3(47)	64.52(20)	86.67(26)	
Hispanic/Latino	10.0(6)	6.45(2)	6.67(2)	
Middle Eastern	1.7(1)	3.22(1)	0(0)	
Mean Continuous Measures (SD)				
IPSA	49.56(11.81)	51.97(11.79)	47.07(11.51)	-1.614
CES-D	34.88(10.00)	35.60(11.12)	34.14(8.82)	-.558
ISEL-Appraisal	24.29(4.85)	24.07(4.84)	24.54(4.94)	.365
ISEL-Tangible	25.31(3.76)	24.50(4.14)	26.14(3.17)	1.701
ISEL-Self Esteem	20.85(4.89)	20.29(3.69)	21.45(4.84)	1.046
ISEL-Belonging	24.12(4.12)	24.76(4.35)	23.62(4.06)	-.911
ASTSPPH	16.50(5.51)	15.50(5.30)	17.43(5.64)	1.344
SDT-Extrinsic	16.21(4.46)	16.38(3.76)	16.03(5.12)	-.292
SDT-Intrinsic	40.40(11.26)	38.31(11.90)	42.57(10.32)	1.442
SDT-Help Seeking	22.88(7.75)	21.00(7.29)	24.82(7.84)	1.902
Current Psychotropic Medication Use				.897 <sup>a</sup>
Yes	6	2	4	
No	55	29	25	
Prior Use of Mental Health Services				.156 <sup>a</sup>
Yes	29.5(18)	32.2(10)	27.6(8)	
No	68.9(42)	67.8(21)	72.4(21)	

\*Note: All results herein are reported as percentages (*n*) except where stated otherwise. Total *n* varies by item as some respondents chose not to answer every question. Statistical testing used t-tests except as indicated: <sup>a</sup> Chi-Square test; <sup>b</sup> Fisher Exact Test. \**p* ≤ .05.

Table 4: Attitude and Motivation over Time by Group Assignment with Effect Size Estimates

Parameter	MI Intervention ( <i>n</i> =31)	Information Control ( <i>n</i> =30)	Cohen's <i>d</i> Effect Size <sup>a</sup>
ATSPPH-short form			
Pre	15.50(5.30)	17.43(5.63)	-.61
Post	17.04(5.32)	19.23(6.09)	-.71
One Month	17.18(5.24)	18.60(5.81)	-.36
SDT-help seeking			
Pre	20.54(6.98)	24.78(7.99)	-.56
Post	22.89(8.12)	26.89(8.82)	-.47
One Month	22.89(8.42)	24.67(8.03)	-.23

Note: Parameters are reported as mean (SD). <sup>a</sup> Positive sign of Cohen's *d* indicates a greater mean is found in intervention group while a negative sign indicates a greater mean in the control group. Guidelines for interpreting Cohen's *d* effect sizes: .2=small; .5=medium; .8=large.

Table 5: Help Seeking Behaviors as Counts by Group Assignment

Parameter	MI Intervention ( <i>n</i> =31)	Information Control ( <i>n</i> =30)	Fisher's Exact Test for Count Data
Behavioral Solicitation			2.093(3)
Requested Self-Help Information	11	9	
Requested Intake Interview	1	2	
Requested Both	5	2	
Requested Neither	14	17	
Self-Reported Help Seeking			3.797(3)
Contacted Counseling Center <sup>1</sup>	2	2 <sup>a</sup>	
Internet Research	5	0	
Spoke with Family	10	8	
Spoke with Friend	6	5	
Self-Reported Behaviors Per Person			9.218(3) *
Zero	19	23	
One	4	4	
Two	7	0	
Three	1	3	

Note: Statistical results reported as value (*df*); <sup>a</sup> this cell includes one participant who sought help through the Psychological Services Clinic via study participation; \**p*<.05

Table 6: Poisson Regression of Response to Direct Solicitation by Group with Covariates

Parameter	<i>B</i>	<i>p</i>	<i>IR (95%CI)</i>
Group Assignment	.975	.024	2.651(1.140,6.163)
SDT Help Seeking Motivation	.161	.002	1.084(1.062,1.299)
SDT Intrinsic Motivation	-.003	.997	.997(.945,1.052)
Age	-.016	.923	.984(.707,1.368)

Table 7: Poisson Regression of Self-Reported Help Seeking Behavior by Group with Covariates

Parameter	<i>B</i>	<i>p</i>	<i>IR (95%CI)</i>
Group Assignment	.867	.027	2.380(1.104,5.133)
SDT Help Seeking Motivation	.081	.041	1.084(1.003,1.171)
SDT Intrinsic Motivation	-.010	.686	.990(.943,1.039)
Age	-.410	.037	.664(.452,.976)

Table 8: Poisson Regression of All Help Seeking Behaviors Combined by Group with Covariates

Parameter	<i>B</i>	<i>p</i>	<i>IR (95%CI)</i>
Group Assignment	.903	.002	2.460(1.401,4.348)
SDT Help Seeking Motivation	.113	<.001	1.119(1.053,1.189)
SDT Intrinsic Motivation	-.007	.711	.993(.958,1.029)
Age	-.209	.103	.664(.452,.976)

Table 9: Participant Satisfaction by Group Assignment

Item Response: Mean (SD)	MI Intervention ( <i>n</i> =30)	Information Control ( <i>n</i> =25)	Cohen's <i>d</i> Effect Size <sup>a</sup>
What was your overall impression?	4.47(.819)	4.04(1.098)	0.444
Would you recommend this to others?	4.23(1.194)	3.79(1.021)	0.388
How informative?	4.31(.967)	3.48(1.377)	0.699
How interesting?	3.87(1.074)	3.22(1.347)	0.532
How helpful?	3.63(1.273)	3.05(1.253)	0.452

Note: Scores are here operationalized using a 7-point likert scale. <sup>a</sup>Guidelines for interpreting Cohen's *d* effect sizes: .2=small; .5=medium; .8=large.

Table 10: Interventionist Ratings of Intervention and Participant Qualities

Parameter	Mean <sup>a</sup> (SD)	F-test <sup>b</sup>
Overall Session Quality	4.58 (2.06)	3.079
Interventionist Qualities		
Manual Implementation	4.48 (2.01)	2.107
Maintenance of MI Style	4.13 (1.82)	1.849
Participant Qualities		
Engagement in Session	4.65 (2.25)	2.205
Problem Recognition	4.52 (2.37)	3.292*
Use of Change Talk	3.78 (2.15)	1.934
Commitment to Seek Help	3.04 (1.85)	1.619

Note: <sup>a</sup>Scores are here operationalized using a 1-7 point likert scale anchored by “1=poor” and “7=excellent.” <sup>b</sup>One-way ANOVAs compare each item between interventionists, with an asterisk (\*) indicating any statistically significant difference ( $p < .05$ ).

Figure 1: CONSORT Flow Diagram for Intervention Testing

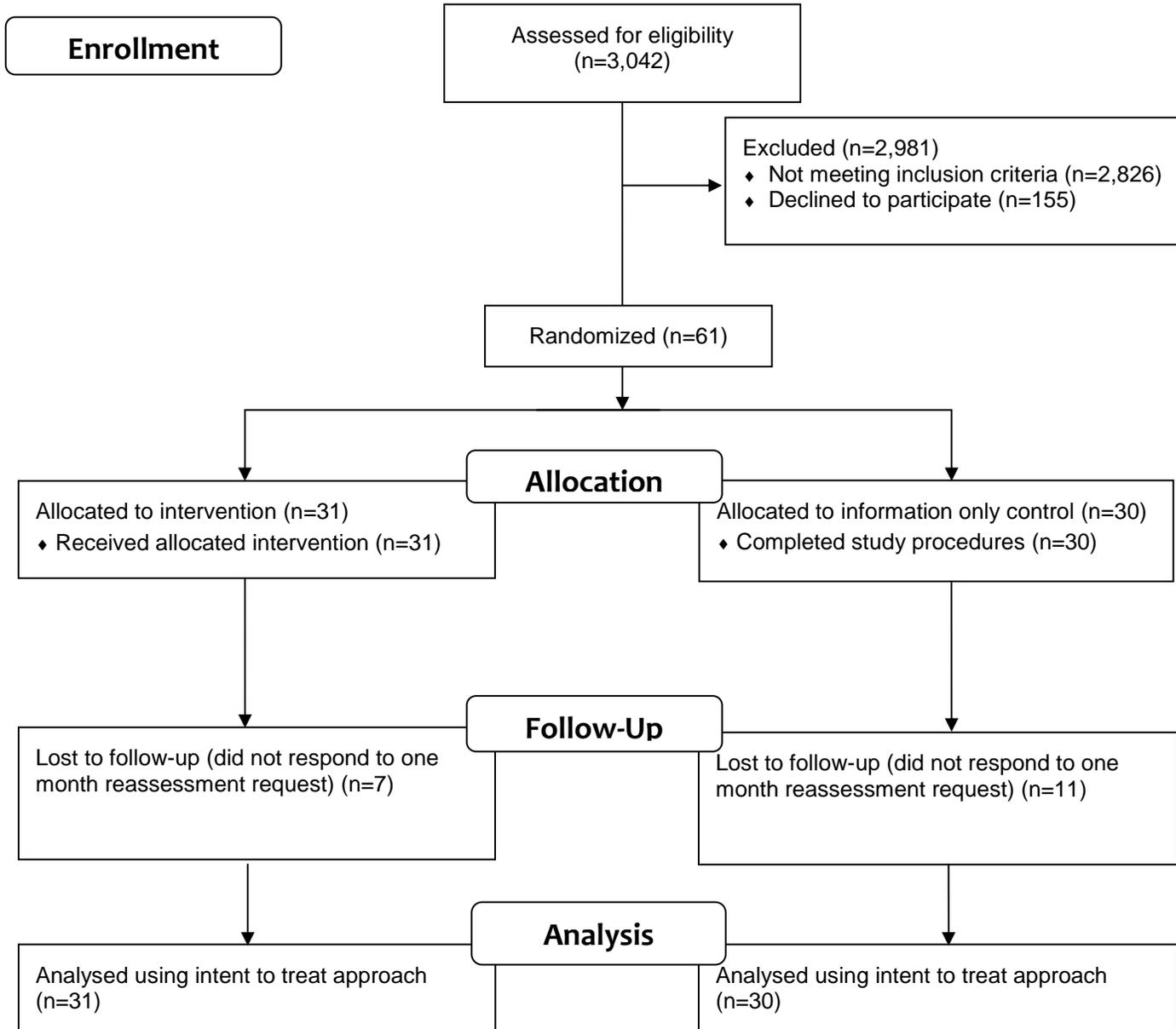


Figure 2: Change in Attitude Toward Seeking Professional Psychological Help (ATSPPH) Score by Group.

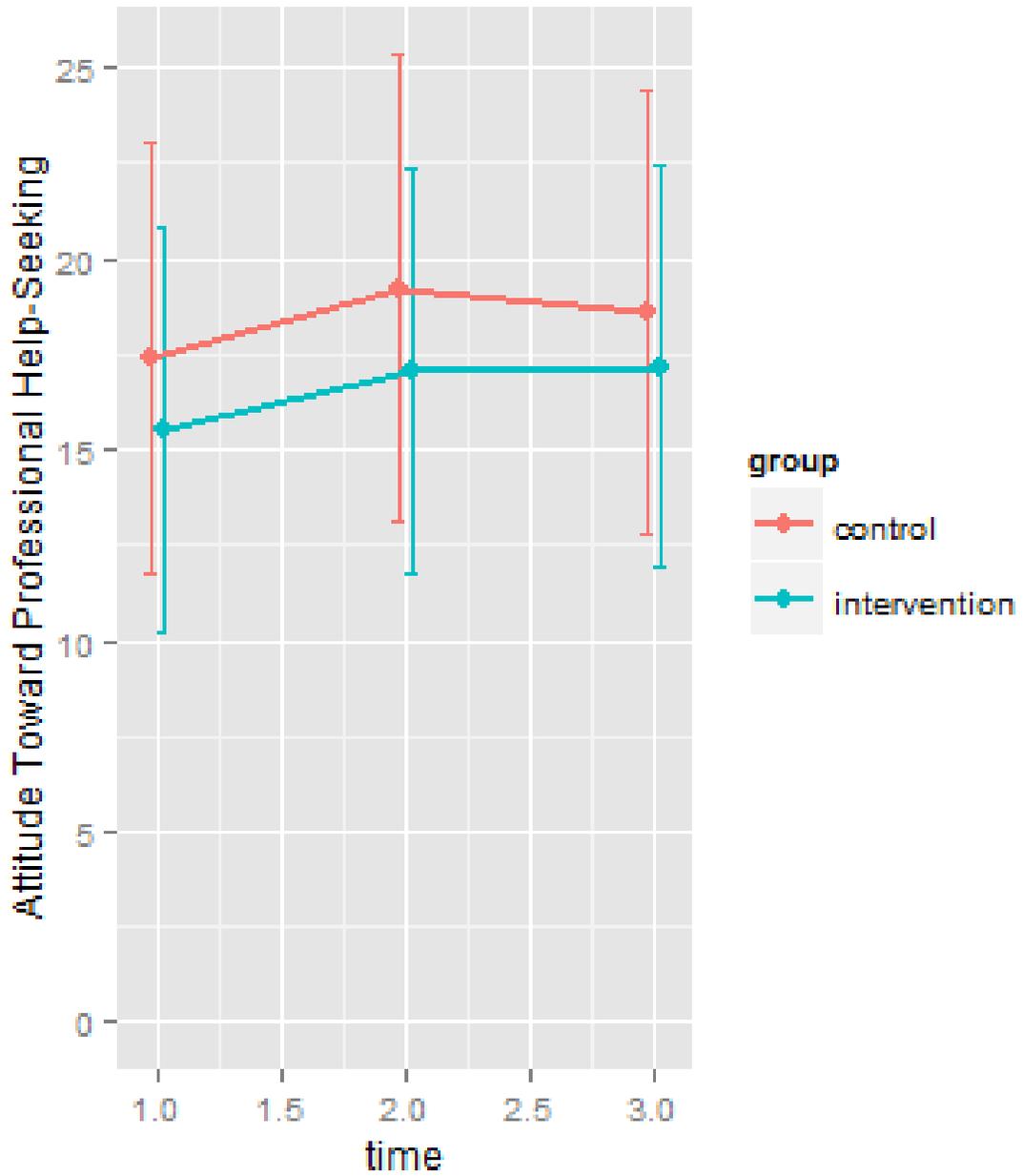


Figure 3: Change in Therapy Motivation Questionnaire--Help Seeking Subscale Score by Group.

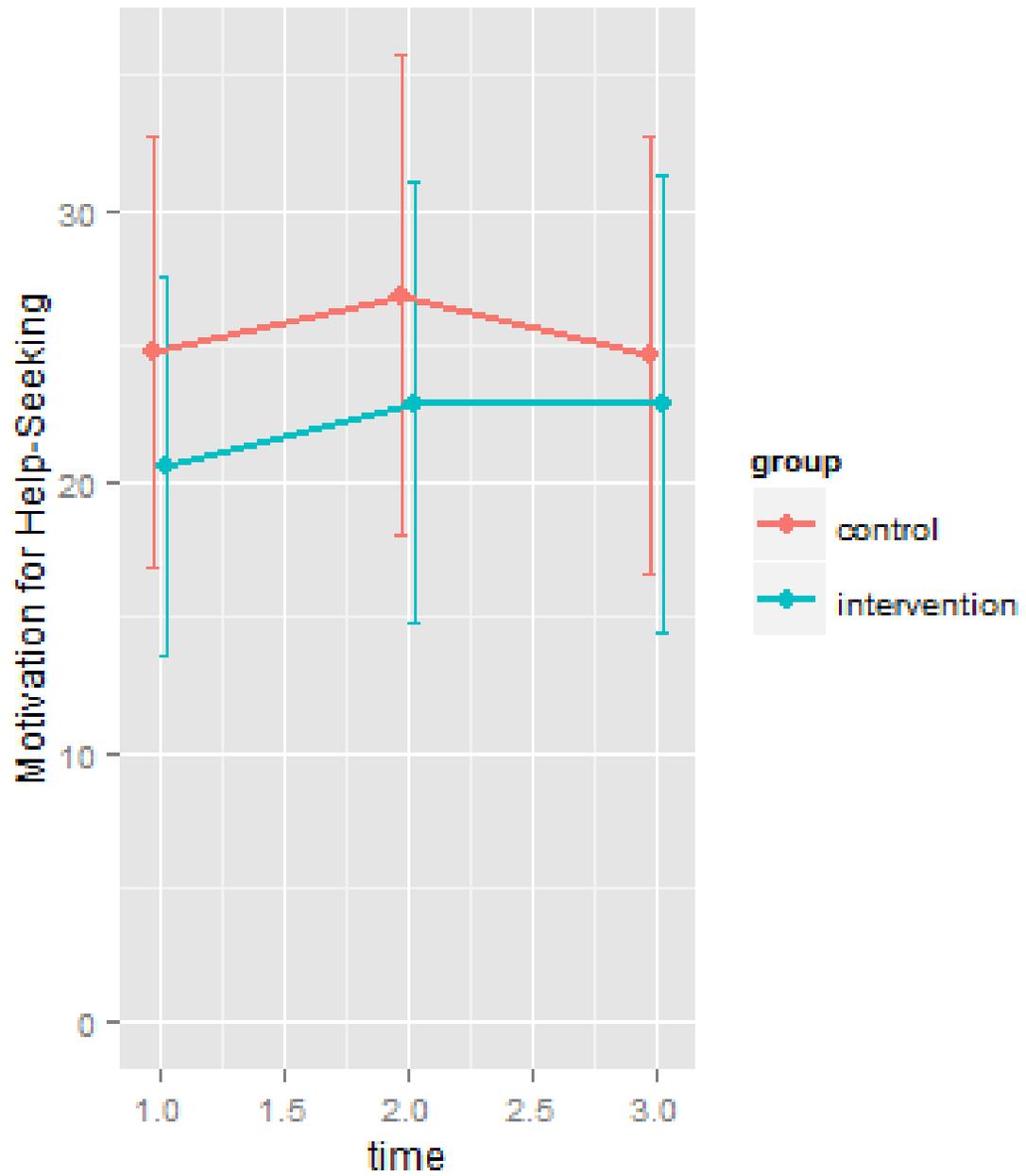


Figure 4: Differences in Cumulative Help Seeking Behaviors at One Month Follow Up by Group

