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Psychological inflexibility and stigma: A meta-analytic review

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The authors declare that they have no conflict of interest.

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Abstract

Stigma is known to have major impacts on the physical and psychological health of many groups. Psychological inflexibility is a psychological process that may help explain the impact of stigma on both self and others. Accordingly, acceptance and commitment therapy (ACT), which targets psychological inflexibility, has been researched as a potential treatment for stigma. In order to provide a comprehensive overview of these issues, this paper offers a systematic review and meta-analysis of the association between psychological inflexibility and stigma, as well as a systematic review of ACT interventions for stigma. The results of the meta-analysis showed a positive, medium-to-large association between psychological inflexibility and stigma measures aggregating across 16 studies. The systematic review of interventions identified 15 studies on ACT interventions for stigma. Initial findings indicate consistent reductions in stigma following ACT interventions, as well as improved outcomes relative to active controls. Data on mediation and moderation, as well as long-term outcomes, are also presented. Implications for conceptualizing and treating stigma, and limitations of the research, are discussed.

Keywords: Stigma; Psychological flexibility; Acceptance and commitment therapy; Review; Meta-analysis

Psychological inflexibility and stigma: A meta-analytic review

Stigma, either applied to the self or from others, has been found to negatively affect many individuals including, but certainly not limited to, those with mental illnesses (SANE Australia, 2007) or physical disabilities (Cahill & Eggleston, 1995), sexual and ethnic minorities (Herek, 2000; Kirschenman & Neckerman, 1991; Meyer, 2003), and social classes (Lott & Bullock, 2007). Stigma may be broken down into three main elements: ignorance or lacking knowledge, prejudice or negative attitudes, and discrimination or negative acts (Thornicroft, Rose, Kassam, & Sartorius, 2007). When stigma is acted upon as discrimination, stigmatized groups may experience many debilitating physical and psychological health problems (Abbey et al., 2011; Pascoe & Richman, 2009) as well as barriers to accessing employment, housing, credit markets, insurance, and admission to school, along with difficulty maintaining interpersonal relationships (Lott & Bullock, 2007; Pager & Shepherd, 2008). Stigma may deter or delay individuals from seeking help for both physical and mental health concerns (Abbey et al., 2011; Eisenberg, Downs, Golberstein, & Zivin, 2009; Zhou, 2009; Topkaya, 2014) as well as impede engagement in work, school, and social activities (SANE Australia, 2007).

Often individuals who identify as belonging to a stigmatized group also begin to direct negative attitudes towards themselves (i.e., self-stigma). Luoma, Kohlenberg, Hayes, Bunting, and Rye (2008) define self-stigma broadly as “shame, evaluative thoughts, and fear of enacted stigma that results from an individual’s identification with a stigmatized group that serves as a barrier to the pursuit of valued life goals” (p.150). Self-stigma is known to be linked to a number of negative outcomes such as isolating behaviors (e.g., Drapalski et al., 2013), poorer overall functioning, and lower quality of life (Picco et al., 2016).

Published stigma interventions have generally focused on reducing stigma towards specified groups. For example, research on mental health stigma suggests three main ways to reduce public stigma (Corrigan & O'Shaughnessy, 2007): protesting stigma, education, and contact with individuals in the stigmatized group. A recent meta-analysis found that besides being the most common and feasible anti-stigma intervention, education was slightly more effective than contact at changing behavioral intentions toward stigmatized groups, though not as effective at changing negative attitudes (Corrigan, Morris, Michaels, Rafacz, & Rüsch, 2012). However, the content of education programs is important as meta-analyses have found that biologically-based education programs actually increase perceived dangerousness and prognostic pessimism towards individuals struggling with mental illness (Kvaale, Haslam, & Gottdiener, 2013). In contrast, research on anti-prejudice interventions suggests different directions for intervention. For example, one recent review found the strongest support for cooperative learning, entertainment, and peer influence, with contact-based interventions requiring more empirical support and multicultural education lacking rigorous evidence (Paluck & Green, 2009). These findings suggest that many types of interventions can be used to address stigma and prejudice, but their effects may differ depending on the outcomes measured and the domain of stigma targeted.

Interventions targeting self-stigma have received less research attention than those aimed at reducing public stigma, but have incorporated a range of techniques. One intervention aimed to help members of stigmatized groups cope with discrimination and experiences with public stigma (Link, Struening, Neese-Todd, Asmussen, & Phelan, 2002). Another intervention, CBT with anti-oppression principles for internalized homonegativity, focused on changing stigmatizing cognitions with the goal of changing behavior (Ross, Doctor, Dimito, Kuehl, &

Armstrong, 2007). These two studies illustrate the two main approaches to targeting self-stigma identified in a systematic narrative review of interventions for self-stigma (Mittal, Sullivan, Chekuri, Allee, & Corrigan, 2012): those that targeted changing self-stigmatizing attitudes, and those that focused on increasing skills for coping with self-stigma such as increasing self-esteem and help-seeking behaviors. Of the fourteen articles, eight reported a decrease in self-stigma outcomes. However, it is notable that even when there are minimal to no changes in self-stigma following intervention, there may still be positive effects in changing how stigmatizing beliefs relate to psychological health (e.g., Link, Struening, Neese-Todd, Asmussen, & Phelan, 2002). A more recent review of self-stigma interventions found similar results and suggested that certain interventions may be better suited to particular populations or particular types of self-stigma; for example, brief interventions may be more appropriate for time-limited treatment settings (Yanos, Lucksted, Drapalski, Roe, & Lysaker, 2015).

One possible explanation for why positive psychological health outcomes may occur after an intervention without a corresponding reduction in self-stigma, is that intervention may be able to change the relationship between stigmatizing beliefs and psychological health (Link et al., 2002). That is, the relationship between stigmatizing beliefs and psychological health may not be causal; beliefs, attitudes, and thoughts do not necessarily need to influence or dictate behavior directly. As such, interventions may help engagement in healthy or helpful behaviors, regardless of the presence of stigmatizing beliefs. Similarly, evidence on the effectiveness of education in reducing public stigma, may point to a possible mediator between negative attitudes towards stigmatized groups and behavioral intentions. This theory suggests that neither self-stigma nor public stigma is inherently linked to poorer psychological health or behavioral intentions towards others, respectively, but their effects are mediated by the relationship with or

the function of stigmatizing thoughts or attitudes. It may also be possible that having a flexible relationship with private events related to stigma could affect the impact of educational interventions (Kenny & Bizumic, 2016b). Given that individuals do not unlearn cultural stereotypes once they are learned (Devine, 1989) it may make more sense to target and modify relationships to internal experiences, such as stigmatizing thoughts, than to change the content or frequency of the internal experiences. This conceptualization would be consistent with the psychological flexibility model of behavior change utilized in Acceptance and Commitment Therapy (ACT; Hayes, Pistorello, & Levin, 2012).

ACT combats the negative impacts of stigma by targeting the relationship with stigmatizing thoughts or attitudes. In ACT, individuals are taught to experience their feelings and notice their thoughts mindfully without trying to change or control their content, and focus on behaviors and actions that will align with valued ways of being (Hayes, Strosahl, & Wilson, 1999). ACT focuses on reducing experiential avoidance and being psychologically flexible in the midst of difficult or painful private events, such as shame, self-evaluations, or fear (Hayes et al., 1999; Twohig, 2012). Individuals engage in experiential avoidance when they avoid, distract, argue, or fight against private events such as uncomfortable or distressing feelings or thoughts and the results on life are negative. Psychological flexibility, on the other hand, allows individuals to experience private events in a way that is mindful, accepting, defused, and allows individuals to act in valued directions no matter the private content. Psychological flexibility involves defusion, or the ability to experience private events and language for what they are: thoughts, verbal sounds, or physiological reactions, and not necessarily a literal truth. Instead of emphasizing change in stigmatizing cognitions or attitudes (e.g. Beckstead & Israel, 2007; Haendiges, 2001; Purvis, 1995; Ross et al., 2007), in ACT, those who experience prejudice

towards stigmatized groups are taught to loosen their grip on these thoughts and other internal experiences and engage with others in valued ways of being. Similarly, clients experiencing self-stigma are taught to engage mindfully with their feelings of shame, self-evaluations, and fear, defuse from them without trying to alter or avoid them, and act in a valued direction.

One way to examine the relevance of ACT to stigma is to explore whether its key mechanism of change (psychological inflexibility) predicts stigma, which would suggest that improving psychological flexibility could address stigma. Consistent with this, several survey studies have found that psychological inflexibility is associated with stigma towards others (e.g., Levin, Luoma, Lillis, Hayes, & Vilardaga, 2014; Masuda & Lutzman, 2011) as well as self-stigma (e.g., Lillis, Luoma, Levin, & Hayes, 2010; Luoma et al., 2013). Providing further support, one recent study found that psychological inflexibility predicted generalized prejudice above and beyond other well-known predictors of prejudice (right wing authoritarianism and social dominance orientation; Levin et al., 2016). Initial research also suggests that components of psychological flexibility may help to protect against some of the damaging effects of stigma. For example, one recent study found that engaging in values clarification may buffer the stress of experiencing racism (West, Graham, & Roemer, 2013), while other studies have indicated that trait mindfulness may moderate the association between experiences of discrimination and symptoms of depression (Brown-Iannuzzi, Adair, Payne, Richman, & Fredrickson, 2014) and anxiety (Graham, West, & Roemer, 2013). These findings suggest that developing the ability to engage in valued behavior by remaining open to internal experiences may be associated with lower levels of stigma towards others as well as self-stigma.

In addition to theoretical support that comes from survey research, several intervention studies have been conducted evaluating ACT for stigma. Although ACT does not necessarily

seek to reduce stigmatizing thoughts or attitudes, studies have shown that ACT may reduce self-stigma among those with HIV (Moitra, Chan, & Stein, 2015; Skinta, Lezama, Wells, & Dilley, 2015) and schizophrenia (Minkesh & Masroor, 2014) as well as individuals who abuse substances (Luoma et al., 2008; Luoma, Kohlenberg, Hayes, & Fletcher, 2012), are overweight or obese (Berman, Morton, & Hegel, 2016; Lillis, Hayes, & Bunting, 2009), or identify as LGBT (Yadavaia & Hayes, 2012). ACT has also been shown to reduce stigma towards racial minorities (Lillis & Hayes, 2007), towards people with psychological disorders (Clarke, Taylor, Bolderston Lancaster, & Remington, 2015; Clarke, Taylor, Lancaster, & Remington, 2015; Kenny & Bizumic, 2016b; Masuda et al., 2007, 2009), and in substance abuse counselors towards their clients (Hayes, Bissett, et al., 2004). Process of change analyses suggest that these effects on stigma are due to changes in the believability of stigmatizing thoughts (Hayes, Bissett et al., 2004), acceptance and flexibility (Lillis & Hayes, 2007), and psychological flexibility (Masuda et al., 2009).

To the best of our knowledge, no study has provided a systematic review of associations between psychological flexibility and stigma, or ACT interventions for stigma. A descriptive review of interventions for stigma was published in 2012 and identified ACT as a promising intervention for stigma (Masuda, Hill, Morgan, & Cohen, 2012). However, as the literature in this area has expanded in recent years, we believed it would be useful to conduct an updated review using a systematic method to identify and synthesize studies in this domain. In order to better understand the current state of the research on these topics, we conducted two systematic reviews: one to identify and integrate all published findings on associations between psychological inflexibility and stigma (Study 1), and one to identify and integrate all published findings on the efficacy of ACT-based interventions for stigma (Study 2). A meta-analysis

examining the associations between psychological inflexibility and stigma was also conducted to aggregate the findings of Study 1 and further clarify the relevance of ACT's mechanisms of change to stigma. Data on mediation and moderation as well as long-term outcomes were also examined in Study 2 in order to provide a comprehensive overview of the evidence regarding ACT interventions in this area. The aims of this paper are to provide a coherent summary of what is known regarding the relationship between psychological inflexibility and stigma including an estimate of the correlation between psychological inflexibility and stigma based on existing research, and describe how ACT has been utilized to target stigma in various domains and the impact of ACT interventions on stigma and related outcomes.

Study 1 - Methods

This review and report follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher, Liberati, Tetzlaff, Altman, & PRISMA Group, 2009). In order to fully assess the status of the literature on psychological inflexibility, ACT, and stigma, a systematic search of research databases was performed to identify peer-reviewed articles describing associations between a measure of psychological inflexibility or experiential avoidance, such as the Acceptance and Action Questionnaire (AAQ) and its variants, and a measure of stigma as well as articles describing ACT-based interventions for stigma. In order to avoid excessive heterogeneity, studies that only used a measure of a specific facet of psychological flexibility other than experiential avoidance such as valuing or defusion were not included. First, a search was conducted of PsycINFO using each possible combination of one of five ACT-related terms (terms used were “psychological flexibility,” “experiential avoidance,” “Acceptance and Action Questionnaire,” “acceptance and commitment training,” or “acceptance and commitment therapy”) paired with one of five stigma-related terms (terms used were

“stigma,” “self-stigma,” “prejudice,” “stigmatization,” or “stigmatized”) using the Boolean operator AND. Results returned were therefore related to at least one ACT term and one stigma term. A second search was conducted of publications indexed on the Association for Contextual Behavioral Science website using the terms “stigma,” “self-stigma,” “stigmatization,” “stigmatized,” and “prejudice.” The search was conducted in December 2016 and identified all articles available at that time.

The first self-report measure developed to assess psychological inflexibility was the AAQ (Hayes, Strosahl, et al., 2004). The first published version contained 9 items (a 16-item version was also developed and used in several early studies, but had low internal consistency; Hayes et al., 2004). The AAQ-II, a revised 7-item version, measures the same construct as the original 9-item AAQ, but with better psychometric properties (e.g. internal consistency of .78-.88, increased from .70; Bond et al., 2011). Higher scores indicate higher levels of inflexibility in both versions (Bond et al., 2011; Hayes, Strosahl, et al., 2004). Numerous domain-specific variants of the AAQ exist, and some are particularly relevant to stigma, such as the Acceptance and Action Questionnaire-Stigma (AAQ-S; Levin, et al., 2014), the Acceptance and Action Questionnaire for Weight (AAQW; Lillis & Hayes, 2008) and the Acceptance and Action Questionnaire for Substance Abuse (AAQ-SA; Luoma, Drake, Kohlenberg, & Hayes, 2011). Other measures have been developed for experiential avoidance and psychological inflexibility in recent years, but versions of the AAQ remain the most commonly used.

Sixty-four results were identified in the original search (see Figure 1 for a flow diagram). Results were excluded from the review if they were not published in a peer-reviewed journal (n=18) or did not present new empirical findings (i.e., conceptual papers and reviews of existing literature; n=5). The remaining articles (n=41) were further evaluated for inclusion in the review

of correlational research (Study 1) and the review of interventions (Study 2). Articles were excluded from the Study 1 review if they did not use a measure of psychological inflexibility or experiential avoidance (n=9), did not use a measure of stigma (n=2), or did not report any Pearson correlation between a measure of psychological flexibility and a measure of stigma (n=13). An additional paper (n=1) was excluded because it only reported a correlation that had been previously published in another article already included in the review. These eligibility criteria were selected to ensure that studies were relevant to the present review. Studies were evaluated against the eligibility criteria by the first author. This resulted in 16 articles identified for the meta-analysis of correlational research on psychological flexibility and stigma. All articles included in this review are marked with a “*” in the reference section.

Each article was analyzed for sample type (e.g. students, individuals with a particular diagnosis, individuals receiving or seeking treatment for a particular concern), psychological inflexibility and stigma measures used, sample size, and Pearson correlation. Psychological inflexibility measures were defined as any measures written to assess psychological inflexibility/flexibility or experiential avoidance. Stigma measures were defined as measures that assessed beliefs, attitudes, intentions, or behaviors connected to stigma towards self or others (shame was also included). Correlations between measures of psychological inflexibility/flexibility and measures of stigma were extracted from the selected studies for the review and meta-analysis. If correlations were reported for multiple time points, only baseline correlation(s) were included in the review. If a measure had multiple subscales, only the total score was included in the table. If the total score was not reported, then correlations for subscales were included in the table. Data were extracted by the first author and checked by the second author.

A meta-analysis was conducted to aggregate the results of these studies into a single estimated correlation using Comprehensive Meta-Analysis (Borenstein & Rothstein, 1999). For each study that presented multiple correlations between measures of psychological flexibility and measures of stigma, the correlations were aggregated into a single correlation to account for study effects in the meta-analysis. Additional pre-specified analyses tested whether psychological flexibility is more relevant to self-stigma or stigma towards others. First, subgroup analyses were done to calculate an overall effect size for self-stigma and stigma towards others. Next, a mixed effects model with Q tests based on analysis of variance was used to test whether the correlation between psychological flexibility and self-stigma was significantly larger than the correlation between psychological flexibility and stigma towards others. Random effects models were used for all analyses to appropriately represent the heterogeneity between studies in type of sample and type of stigma measured. Heterogeneity was assessed by calculating the I^2 statistic. Recommended procedures were followed to examine potential publication bias including calculation of fail safe N and trim and fill.

Study 1 - Results

Characteristics of the Correlational Studies

Sixteen correlational studies were identified that presented findings on associations between psychological flexibility and stigma. These studies are described in Table 1. All correlations were scored such that positive scores indicate a positive correlation (i.e. higher psychological inflexibility and higher stigma). Sample sizes were generally adequate, with 4 correlations calculated for a sample of less than 100 participants, 6 for a sample of 100-200 participants, and 10 for a sample of more than 200 participants (Lillis et al., 2010; Luoma et al. 2011; and Luoma et al. 2013 reported separate results for multiple samples).

These correlational studies have investigated the association between psychological flexibility and many different types of stigma, including internalized stigma and perceived stigma among those with a mental illness (Chan & Mak, 2015; Rüsçh et al., 2006), stigma towards those with a mental illness (Masuda & Latzman, 2011; Masuda et al., 2009); internalized homophobia (Gold, Marx, & Lexington, 2007), weight self-stigma (Lillis et al., 2010; Lillis et al., 2011; Palmeira, Cunha, Pinto-Gouveia, Carvalho, & Lillis, 2016; Palmeira, Pinto-Gouveia, & Cunha, 2016); and internalized weight bias and body shame (Webb & Hardin, 2016).

Accordingly, these studies also investigated a wide range of populations as appropriate for assessing different types of stigma. While four studies used an undergraduate student sample (Levin et al., 2014; Masuda & Latzman, 2011; Masuda et al., 2009; and Webb & Hardin, 2016), other studies were conducted among individuals in treatment for substance use (Luoma et al., 2007; Luoma et al., 2008; Luoma, O'Hair, Kohlenberg, Hayes, & Fletcher, 2010; Luoma et al., 2011; and Luoma et al., 2013), individuals with mental illness in Hong Kong (Chan & Mak, 2015); gay male sexual assault survivors (Gold et al., 2007); individuals with epilepsy (Heersink, Kocovski, MacKenzie, Denomme, & Macrodimitris, 2015); overweight/obese individuals (Lillis et al., 2010; Palmeira, Cunha, et al., 2016; Palmeira, Pinto-Gouveia, et al., 2016) and women with borderline personality disorder as well as women with social phobia in Germany (Rüsçh et al., 2006).

Most of the studies used well-validated measures such as the AAQ-II (Bond et al., 2011), Weight Self-Stigma Questionnaire (WSSQ; Lillis et al., 2010) and Internalized Shame Scale (ISS; Cook, 1987). However, several studies used novel adaptations of scales lacking validation

information (Luoma et al., 2007; Luoma et al., 2010) or unpublished translations (Rüsch et al., 2006) of scales.

Findings of the Correlational Studies

Across this diverse range of studies, significant correlations were consistently found between measures of psychological inflexibility and measures of stigma. Out of 39 correlations reported, all were in the expected direction and 33 reached statistical significance. Using Cohen (1988)'s conventions of $r=.10$, $r=.30$, and $r=.50$ as indicators of small, medium, and large correlations, 14 of the reported correlations were large, 12 were medium, and 7 were small but statistically significant.

Significant correlations were found between psychological inflexibility and measures of stigma towards those with a mental illness (Masuda et al., 2009; Masuda & Latzman, 2011); self-stigma related to mental illness (Chan & Mak, 2015); self-stigma related to epilepsy (Heersink et al., 2015); internalized homophobia (Gold et al., 2007); social distancing and ethnocultural empathy (Levin et al., 2014); internalized shame (Luoma et al., 2007; Luoma et al., 2008; Luoma et al., 2011); self-stigma related to substance use (Luoma et al., 2007; Luoma et al., 2011; Luoma et al., 2013); perceived stigma related to substance use (Luoma et al., 2007; Luoma et al., 2008); stigma-related rejection (Luoma et al., 2007); active coping with stigma (Luoma et al., 2011); weight stigma (Lillis et al., 2010; Palmeira, Pinto-Gouveia, et al., 2016); weight bias internalization, and body image shame (Webb & Hardin, 2016).

Associations were generally larger for domain-specific variants of the AAQ (i.e., versions that measure psychological inflexibility specifically in relation to a domain such as stigmatizing attitudes or obesity), rather than the more general AAQ or AAQ-II. For example, correlations between the AAQ-Stigma and stigma-related measures were larger than correlations between the

AAQ-II and the same measures in one study (Levin et al., 2014). The correlation between the AAQW and weight-self stigma is also higher ($r=0.76$) than to the association between the AAQ and weight-self stigma ($r=0.51$; Lillis et al., 2010).

Meta-Analysis

Aggregating across all 16 correlational studies, the overall effect size was statistically significant and medium to large ($r=.48$, 95% CI=.36, .58, $z=7.26$, $p<.001$, $k=16$, $n=4,209$, $I^2=0\%$). The results are presented in a forest plot in Figure 2. This indicates that averaging across samples and types of stigma, psychological flexibility has a relatively large and stable correlation with stigma. The I^2 statistic indicates low variation between studies attributable to heterogeneity.

Types of stigma. Separate effect sizes were also calculated for studies of the correlation between psychological inflexibility and self-stigma as compared to stigma towards others. In the subgroup analysis for studies testing associations between psychological inflexibility and self-stigma, the aggregate effect size was large ($r=.54$, 95% CI=.44, .62, $z=8.93$, $p<.001$, $k=13$, $n=2,735$, $I^2=0\%$). In the subgroup analysis for associations between psychological inflexibility and stigma towards others, the aggregate effect size was small but significant ($r=.20$, 95% CI=.15, .25, $z=7.51$, $p<.001$, $k=3$, $n=1,474$, $I^2=1.55\%$). A Q-test was conducted to compare the two aggregate effects and indicated that the two effects are significantly different ($Q=29.63$, $df=1$, $p<.001$). Thus, across the included studies, psychological flexibility was more strongly correlated with self-stigma than stigma towards others.

Specificity of psychological inflexibility measure. Because domain-specific measures of psychological inflexibility had larger correlations with stigma than generalized measures, additional post hoc analyses were conducted to determine if this was a statistically significant difference. It was not possible to run a Q-test, as some studies included both generalized and

domain-specific psychological inflexibility measures. However, separate meta-analyses were conducted for generalized and specific measures. Although the size of the aggregated correlation was larger for domain specific measures ($r=.59$, 95% CI= .45, .69, $z=7.12$, $p<.001$, $k=8$, $n=2,457$, $I^2=0$ %) compared to generalized measures ($r=.40$, 95% CI= .27, .52, $z=5.59$, $p<.001$, $n=3,135$, $I^2=0$ %), the confidence intervals overlap, indicating that this is likely not a statistically significant difference.

Publication bias. Standard methods were used to investigate the potential for publication bias to have influenced the overall effect size. The trim and fill method was applied and did not indicate any need for adjustment. In addition, fail safe N estimates were calculated, which indicated that 3582 studies with a correlation of $r=0$ would be necessary to make the correlation nonsignificant, and 59 would be needed to bring the correlation under $r=.1$.

Study 2 – Methods

Articles were initially identified using the process described under *Study 1 – Methods*. This search resulted in the identification of 41 publications in peer-reviewed journals that presented novel findings (see Figure 3 for a flow diagram). Articles were excluded from the Study 2 review if they did not present new results from an intervention ($n=24$), described an intervention that did not target stigma ($n=2$), or presented results of an intervention that did not target psychological flexibility (all remaining studies met this criterion). Once again, these eligibility criteria were selected only to ensure that identified studies were relevant to the current review and studies were evaluated for eligibility by the first author. This resulted in 15 studies identified for the review of interventions for stigma targeting psychological flexibility. All articles included in this review are marked with a “***” in the reference section.

The results of this search are presented in a systematic, narrative review synthesizing the findings on ACT interventions for stigma. In reviewing the interventions, each article was analyzed for sample type (as defined previously), sample size, study design (e.g., randomized controlled trial, uncontrolled pilot trial), intervention format (e.g., workshop, group therapy, individual therapy), dosage (number and length or sessions), type of stigma targeted, all outcomes reported, and results at posttreatment and follow-up. As in Study 1, data were extracted by the first author and checked by the second author. Results were evaluated for statistical significance as reported by the article authors. Effect sizes were calculated for studies that did not report them based on means and standard deviations where available. Articles were also reviewed for notable secondary analyses such as tests of mediation and moderation. Of note, due to the wide variety of methods, measures, and samples used in these intervention studies we did not conduct a meta-analysis to calculate an overall effect size.

Study 2 - Results

Characteristics of ACT-based Interventions for Stigma

Fifteen articles were identified that present results from an intervention that targets stigma towards others or self-stigma using an ACT-based approach. Basic characteristics of these studies are presented in Table 2. All studies were conducted in the United States with the exception of two studies conducted in the United Kingdom (Clarke, Taylor, Bolderston, et al., 2015; Clarke, Taylor, Lancaster, et al., 2015), one conducted in Australia (Kenny & Bizumic, 2016b), and one conducted in India (Minkesh & Masroor, 2014). The studies vary notably in terms of methodological approach and rigor, including 1 multiple-baseline study, 6 randomized trials with active controls, 1 randomized waitlist-controlled trial, 1 nonrandomized comparison trial, 5 uncontrolled pilot trials, and 1 counterbalanced time-series group study. The studies are

generally small. Seven have total sample sizes below 50, five between 50 and 100, and three greater than 100 (the largest sample size being $n=152$).

The types of stigma addressed in these studies are highly diverse. Six studies focused primarily on self-stigma while seven focused primarily on stigmatizing attitudes toward others. The specific areas of stigma targeted by the studies include stigma towards individuals with mental illnesses in general (Kenny & Bizumic, 2016b; Masuda et al., 2007; Masuda et al., 2009), stigma by treatment providers towards individuals with personality disorders (Clarke, Taylor, Bolderston, et al., 2015; Clarke, Taylor, Lancaster, et al., 2015), stigma by substance use counselors toward their clients (Hayes, Bissett, et al., 2004), self-stigma among substance users (Luoma et al., 2008; Luoma et al., 2012), self-stigma in individuals with schizophrenia (Minkesh & Masroor, 2014), self-stigma in obese individuals (Berman et al., 2016; Lillis et al., 2009), prejudice toward racial and ethnic minorities (Lillis & Hayes, 2007), HIV stigma (Moitra et al., 2015; Skinta et al., 2015), and self-stigma related to sexual orientation (Yadavaia & Hayes, 2012). Several studies targeted a general population such as undergraduate students (e.g. Lillis & Hayes, 2007; Masuda et al., 2009), while others delivered interventions tailored to individuals struggling with self-stigma (e.g. Lillis et al., 2009; Skinta et al., 2015) or professionals who deliver services to individuals with stigmatized conditions (e.g. Clarke, Taylor, Bolderston, et al., 2015; Clarke, Taylor, Lancaster, et al., 2015; Hayes, Bissett, et al., 2004).

These interventions also differed notably in format and dosage. Most of the studies used a group format, while three used an individual format (Minkesh & Masroor, 2014; Moitra et al., 2015; Yadavaia & Hayes, 2012). However, dosage varied from very brief, typically for more general workshops (e.g. one class period; Lillis & Hayes, 2007) to quite intensive for more therapeutic, targeted workshops (e.g. eight group sessions; Skinta et al., 2015). There are notable

exceptions to this pattern such as the very brief, 2-session intervention for HIV stigma delivered by Moitra et al. (2015).

The content of the interventions was relatively consistent across studies, reflecting the transdiagnostic model of psychological flexibility that defines ACT. Every intervention included a values component to help participants identify their personal values in behavior relevant to the topic and an acceptance component designed to increase openness to difficult internal experiences. Ten of the interventions either presented an ACT conceptualization of stigma or began by identifying and discussing the workability of a control agenda. Six of the interventions explicitly addressed committed action, eight of the interventions utilized defusion techniques, and ten included a mindfulness component. Each of these interventions is broadly consistent with what would be expected from an ACT conceptualization of stigma.

However, there are also some unique components designed to target specific stigma-related concerns. For example, two interventions for self-stigma in substance users added exercises related to increasing human connection (Luoma et al., 2008; Luoma et al., 2012) and others included an explicit focus on compassion (Clarke, Taylor, Lancaster, et al., 2015; Masuda et al., 2007; Skinta et al., 2015) or size acceptance (Berman et al., 2016).

The studies generally converged in the selection of ACT process measures, with the AAQ (Hayes, Strosahl, et al., 2004) and AAQ-II (Bond et al., 2011) being by far the most common, as well as some secondary outcome measures, such as the General Health Questionnaire-12 (GHQ-12; Goldberg, 1972) to measure general psychological distress. However, the studies varied widely in terms of the stigma measures used. Part of this variation was certainly due to the need to measure domain-specific stigma as an outcome; however, even among studies addressing stigma towards those with a mental illness in general, both the Community Attitudes toward

Mental Illness (CAMI; Taylor & Dear, 1981) and the Prejudice towards People with Mental Illness scale (PPMI; Kenny & Bizumic, 2016a) are in use. In addition, due to the limited availability of validated measures for specific areas of stigma and self-stigma, five of these studies developed or adapted their own measures. There are also relatively few measures of behavioral outcomes in these studies, with some notable exceptions such as care engagement in Moitra et al. (2015) and drug and alcohol use in Luoma et al. (2012).

Outcomes

The majority of the studies adopted measures of stigmatizing attitudes or self-stigma as the primary outcome measure. Some behavioral measures were also treated as primary outcomes, such as drug/alcohol use and treatment utilization in Luoma et al. (2012) and care engagement in Moitra et al. (2015). One study measured positive behavioral intentions as its primary outcome (Lillis & Hayes, 2007). The studies incorporated a wide range of secondary outcomes, including burnout for care providers, distress and quality of life, and social support. Because the varied approaches and targets of these interventions makes it difficult to summarize the results without losing sight of important details, the main results for each study are described.

Interventions targeting generalized stigma towards those with a mental illness.

Masuda et al. (2007) compared a 2.5 hour ACT group to education in a randomized controlled trial. The intervention was directed to undergraduate students and targeted stigma towards individuals with mental illness. ACT and education both resulted in a decrease in stigmatizing attitudes at post, which was maintained at 1-month follow-up. A significant effect was found for time but not for condition, indicating no overall difference between the ACT and education conditions. Baseline psychological flexibility was found to moderate the effects of condition, such that those with high baseline flexibility improved in either condition but those with low

baseline flexibility only improved in the ACT condition, not education. Pre-to-post effect sizes were reported separately for individuals with low baseline psychological flexibility ($d=.91$ for ACT, $d=.04$ for Education) and high baseline psychological flexibility ($d=.60$ for ACT, $d=.72$ for Education).

Masuda et al. (2009) is an uncontrolled pilot study of a 2.5 hr ACT group to decrease stigmatizing attitudes about mental illness in undergraduate students. Mental health stigma decreased significantly by post and the change was maintained at 1-month follow-up. Analyses indicated that stigmatizing attitudes decreased significantly from baseline to post (CAMI: $d=1.78$) as well as from baseline to follow-up ($d=1.56$).

Kenny and Bizumic (2016b) conducted a nonrandomized comparison trial testing an ACT intervention and an educational intervention for stigma towards those with a mental illness in a brief workshop format. Both interventions resulted in significant reductions in prejudice ($d=0.46$ for ACT, $d=0.20$ for education), but the ACT condition resulted in significantly larger reductions in overall prejudice (between-conditions effect size at post, $d=0.40$).

Interventions targeting self-stigma in those with a mental illness. Minkesh & Masroor (2014) compared treatment as usual (TAU), which included psychoeducation, supportive therapy, and medication, to TAU+ACT in a randomized controlled trial targeting internalized stigma in individuals with schizophrenia. The ACT intervention included 10 to 12 sessions of individual ACT. Internalized stigma decreased from pretreatment to posttreatment in the TAU+ACT group ($d=1.76$), while it increased slightly in the TAU group ($d=0.08$) and the TAU+ACT had significantly lower internalized stigma at posttreatment compared to the TAU group ($d=2.87$). There were no significant changes in the groups from post to 4-month follow-up, indicating that gains were maintained over time.

Interventions for care providers working with stigmatized groups. Hayes, Bissett, et al. (2004) conducted a randomized controlled trial with three conditions: ACT, multicultural training, and education. These interventions were directed at the stigmatizing attitudes of substance abuse counselors towards their clients and delivered in a 1-day workshop format. The ACT condition improved significantly on stigmatizing attitudes from baseline to follow-up ($d=0.32$), while the multicultural condition improved significantly on stigmatizing attitudes from baseline to posttreatment but not baseline to follow-up. The educational control condition did not change across time points. At follow-up, the ACT condition was significantly superior to multicultural training on burnout ($d=0.57$), which was hypothesized to improve as a result of addressing stigma towards counselors' clients.

Clarke, Taylor, Lancaster, et al. (2015) conducted a randomized controlled trial comparing a 2-day ACT intervention to psychoeducation training for decreasing stigmatizing attitudes of care providers towards clients with a personality disorder. Results indicated that attitudes toward clients, staff-perceived quality of therapeutic relationship, and social distancing had improved in both conditions. Stigmatizing attitudes improved significantly for both conditions from baseline to posttreatment and from baseline to 6-month follow-up ($d=0.32$ for ACT, $d=0.46$ for psychoeducation training). However, there were no significant time by condition interactions, indicating that ACT and education did not have significantly different effects on stigma. The same pattern of results was found for therapeutic relationship and social distancing, suggesting that ACT and psychoeducation training were equally effective.

Clarke, Taylor, Bolderston, et al. (2015) compared a 2-day ACT intervention to Dialectical Behavior Therapy (DBT) in a randomized controlled trial, aimed at decreasing stigmatizing attitudes in staff caring for clients with personality disorders. Once again,

stigmatizing attitudes, staff-perceived quality of the therapeutic relationship, and staff distancing improved significantly in both conditions by post and changes were maintained at 6-month follow-up. Effect sizes were $d=0.22$ for ACT and $d=0.26$ for DBT from pretreatment to follow-up on stigmatizing attitudes. There was no interaction of time and condition for any outcomes suggesting that ACT and DBT had equivalent effects.

Interventions targeting self-stigma in substance users. Luoma et al. (2008) conducted an uncontrolled pilot trial of a 6-hour ACT group for self-stigma in individuals in residential treatment for a substance use disorder. The study did not have a follow-up time point, but significant improvements were seen in internalized shame ($d=0.66$), internalized stigma ($d=0.67$), and overall mental health from pretreatment to posttreatment ($d=0.49$), indicating that the ACT group experienced improvements on several important outcomes. Changes in stigma-related rejection, self-concealment, perceived stigma, believability of stigmatizing thoughts, and believability of reasons for using were not significant (all $ps>.05$).

Luoma et al. (2012) implemented a randomized controlled trial comparing residential treatment-based TAU to TAU+ACT, with ACT delivered in three 2-hour groups. TAU at this facility included 5 to 6 therapy groups each day, 6 days a week, including process groups and other groups focused on relapse prevention, life skills, health, parenting, anger management and recreational therapy. In TAU+ACT, the ACT group replaced 6 hours of TAU such that the total intervention time was the same. The ACT intervention targeted shame related to substance use. Shame was measured using the ISS (Cook, 1987). MMRM analysis indicated a significant interaction of time by condition, and within-group t tests showed that the TAU+ACT group had smaller pre-post improvements in shame compared to TAU, but reported greater improvements in shame at the four-month follow-up (TAU+ACT: $d=.26$ from pre to post, $d=.66$ from pre to

follow-up; TAU: $d=.51$ from pre to post, $d=.22$ from pre to follow-up). At follow-up 19.7% percent of TAU participants had decreased shame when compared to pretreatment levels, versus 30.9% of the TAU+ACT participants, a significant difference according to a Fisher's exact test.

Interventions targeting HIV stigma. Moitra et al. (2015) tested a brief, 2-session ACT intervention for HIV stigma in individuals newly diagnosed with HIV in an open trial. The sample was small ($n=8$) and significance testing was not conducted. However, improvements were found on acceptance of HIV status ($d=0.34$), depression ($d=0.09$), HIV stigma ($d=0.07$), and healthcare system distrust ($d=0.14$). The primary outcome targeted was care engagement, and all participants attended at least one medical visit between the intervention and the 3-month follow-up.

Skinta et al. (2015) implemented an open trial of an eight-session group using ACT and Compassion-Focused Therapy (CFT) to target HIV-related stigma in individuals with HIV. Again, the sample size was small ($n=5$) and no significance tests were conducted. Data were reported for the three individuals who attended the group regularly, which indicated increased psychological flexibility ($d=0.96$ from baseline to 8-week follow-up) and decreased HIV stigma ($d=2.29$ from baseline to 8-week follow-up).

Interventions targeting self-stigma related to sexual orientation. Yadavaia & Hayes (2012) implemented a multiple baseline single-subject study of 6 to 10 ACT sessions for self-stigma related to same-sex attraction, with five adults. HLM analyses indicated that the interference ($d=1.26$), distress ($d=1.99$), and believability ($d=1.43$) of thoughts related to sexual orientation decreased significantly during treatment, while the frequency of such thoughts did not decrease significantly. Significant improvements were found on depression, stress, and social support from baseline to 12-week follow-up.

Interventions targeting weight self-stigma. Lillis et al. (2009) conducted a randomized waitlist-controlled trial of a 1-day ACT workshop among overweight/obese individuals. Significant improvements were found on obesity-related stigma ($d=0.63$ in ACT condition) at the 3-month follow-up relative to the waitlist condition. Other outcomes were also found to improve in ACT relative to waitlist including quality of life, binge eating, weight, and psychological flexibility.

Berman et al. (2016) reported the findings from an open trial of an intervention combining ACT with a Health at Every Size (HAES) intervention for size acceptance. The intervention consisted of eleven 2-hour group sessions. Weight self-stigma decreased significantly from pretreatment to posttreatment and gains were maintained at a three-month follow-up ($d=1.25$ from baseline to follow-up). Significant improvements were also found on depressive symptoms, obesity-related quality of life, and body image acceptance.

Interventions targeting racial/ethnic prejudice. Lillis and Hayes (2007) conducted a classroom-based intervention comparing ACT and educational training in a counterbalanced within-group time-series study. Only the ACT intervention resulted in a significant increase in positive behavioral intentions towards minority groups from baseline to follow-up ($d=0.30$ for ACT, $d=0.07$ for education).

Summary of Main Outcomes

The results show a promising pattern for ACT interventions for stigma. At least one primary outcome improved following the intervention in every study, excluding Skinta et al. (2015) and Moitra et al. (2015) which presented some promising results but lacked the power for any statistical tests. In addition, while ACT was often equivalent to comparison conditions, when differences did emerge, they favored ACT. For example, Hayes, Bissett, et al. (2004) found that

their ACT condition had significantly less burnout at follow-up when compared to multicultural training and an educational control. Other studies found that ACT decreased overall prejudice more than an educational control (Kenny & Bizumic, 2016b) and that ACT led to higher positive behavioral intentions than an educational control (Lillis & Hayes, 2007). Of eight studies that compared ACT to active controls, two reported completely equivalent outcomes for ACT and the control condition (Clarke, Taylor, Bolderston, et al., 2015; Clarke, Taylor, Lancaster, et al., 2015), another two found advantages for ACT on some outcomes or for some subgroups (Hayes, Bissett, et al., 2004; Masuda et al., 2007), and four reported that ACT was significantly superior on primary outcomes (Kenny & Bizumic, 2006b; Lillis & Hayes, 2007; Luoma et al., 2012; Minkesh & Masroor, 2014).

Long-term outcomes

There are some intriguing findings when considering the trajectory of the ACT interventions in contrast to comparison conditions. Treatment gains were generally maintained from post to follow-up for ACT. However, one study found no pre-post improvement in stigmatizing attitudes, but a significant pre-follow up improvement in the ACT condition (Hayes, Bissett, et al., 2004). Another study found that internalized shame decreased more slowly in an ACT condition compared to treatment as usual from pre to post, but the ACT condition had significantly lower shame at follow-up (Luoma et al., 2012). Alternatively, Masuda et al. (2007) found that although stigma decreased from baseline to follow-up after ACT and education interventions, there was a significant rebound in stigma in both conditions from post to follow-up. Further research is needed to clarify the trajectory of ACT interventions for stigma compared to other interventions and to determine if there are any sample characteristics such as contact with stigmatized groups or distress that moderate this trajectory.

Unexpected findings

There are a few unexpected effects found in these interventions that are worthy of note. One study found that an ACT intervention and education resulted in increases on the Malevolent Attitudes subscale of the PPMI, which suggests that this type of intervention could have unexpected negative effects in specific areas (Kenny & Bizumic, 2016b). Another reported that burnout increased and psychological flexibility decreased from pretreatment to posttreatment among staff who care for individuals with personality disorders and received ACT (Clarke, Taylor, Bolderston, et al., 2015). While these changes had flattened out again by follow-up, it is striking that psychological flexibility dropped following an ACT intervention. In addition, the finding of Luoma et al. (2012) that shame initially decreased more in TAU compared to ACT, but was significantly lower in ACT at follow-up also suggests that ACT interventions may have notably different effects on key outcomes depending on when they are measured.

Mediators

Initial mediation research is supportive of the role of psychological flexibility and its components as processes of change. For instance, acceptance and flexibility partially mediated the difference between treatment conditions on positive action intentions in an intervention for racial prejudice (Lillis & Hayes, 2007). In addition, changes in weight-related psychological flexibility mediated changes in all outcome variables in an intervention for weight stigma in a cross-sectional test of mediation (Lillis et al., 2009). Several other studies have conducted analyses that investigate processes of change but would not qualify as tests of mediation. For instance, one study found that changes in psychological flexibility and changes in internalized shame were correlated (Luoma et al., 2008), and another found that changes in psychological

flexibility were associated with changes in stigma (Masuda et al., 2009). Overall, these results provide preliminary support for ACT improving stigma by enhancing psychological flexibility.

Moderators

Tests of potential moderators were nearly absent among these studies. The only test of moderation conducted indicated that ACT reduced stigma towards others at follow up regardless of baseline levels of psychological flexibility, while stigma was higher among individuals with lower baseline psychological flexibility in the education condition (Masuda et al., 2007). This suggests that educational methods may be effective only among individuals who are relatively psychologically flexible, while ACT, which seeks to enhance psychological flexibility, might be useful for individuals at any level of flexibility.

Discussion

The aim of this paper was to provide a comprehensive review of studies that have examined associations between psychological flexibility and stigma, as well as studies that have used an ACT-based intervention to target stigma. Accordingly, a meta-analysis of associations was conducted and a systematic narrative review was presented summarizing current findings on each of these topics.

The meta-analysis results indicated that measures of psychological inflexibility are consistently associated with stigma towards others and oneself with an overall medium to large effect size. These relationships have been identified across many different domains of stigma, including mental illness, substance use, epilepsy, weight and body image, and sexual orientation. It appears that this relationship may be weaker for stigma towards others compared to self-stigma. This may indicate that psychological flexibility is particularly important to address when targeting the effects of stigma in stigmatized groups. However, no studies have explicitly

attempted to address the question of whether or not psychological flexibility has differential relationships to various types of stigma (e.g., self, perceived, enacted), so more research is necessary before drawing firm conclusions.

Associations appeared to be stronger between specific areas of stigma and domain-specific variants of the AAQ, such as the AAQW and the AAQ-SA, which could suggest that psychological flexibility related to particular stigmatized characteristics or identities is likely to be important in understanding and targeting stigma. Although there was not a statistically significant difference in the size of the correlations of stigma with these two types of measures in the current study, further studies should explore this question systematically by including both types of measures in their research. In general, the results of correlational research suggest that psychological inflexibility is likely connected to the experience of stigma in a wide range of domains and may be a useful target for intervention. One potential theoretical approach is to conceptualize stigmatizing attitudes towards various groups as a more generalized process of being prejudiced towards others, which would be consistent with one recent study finding that psychological inflexibility predicts a latent generalized prejudice variable composed of stigmatizing attitudes towards obese individuals, gay men, substance abusers, African Americans, and women (Levin et al., 2016). Findings like these suggest that psychological inflexibility holds promise as an individual-level variable that may be manipulated in order to decrease the effects of stigma across a range of populations.

Accordingly, ACT interventions have now been tested for many different types of stigma, and these studies have found promising results. The initial findings of the 15 ACT-based interventions for stigma that have been published thus far show a fairly consistent pattern of decreases in stigma following treatment. The results of this review indicate that pursuing this line

of research may be fruitful in expanding the repertoire of effective interventions for stigma. The positive outcomes from these studies suggest that ACT interventions can be used to target self-stigma and stigma towards others in relation to mental illness, substance use, race, etc. in a wide variety of populations.

In addition, while research on processes of change in ACT interventions for stigma is limited, initial findings support proposed processes of change such as psychological flexibility and believability of stigmatizing attitudes (Lillis & Hayes, 2007; Lillis et al., 2009; Luoma et al., 2008; Masuda et al., 2009). If further research indicates that psychological flexibility and its component processes mediate the effects of ACT interventions for stigma, this would support the claim that ACT provides a useful lens through which to understand stigma and may be uniquely useful in targeting certain aims, such as increasing behavioral flexibility in the presence of stigmatizing thoughts. Research on possible moderators is also very limited, with only one study reporting any tests of moderation (Masuda et al., 2007). The results of this trial indicated that ACT may be advantageous in helping to decrease stigma in a wider range of individuals, compared to other interventions such as education that may only be effective for individuals who are already high in baseline flexibility.

The proposition that stigma interventions may be more effective if they seek not to change stigmatizing thoughts, but to reduce their impact on behavior, is also concordant with recent research in social psychology that suggests that attempts to control prejudiced thoughts may backfire. For example, individuals with higher external motivation to control prejudice (e.g., avoid social sanction) score higher on implicit prejudice, and this association is mediated by attempts to control their responses, suggesting that ineffective efforts to control one's prejudice may result in expressing greater prejudice (Hausmann & Ryan, 2004). Other studies have found

that attempting to suppress stereotypes appears to result in a rebound effect in which those stereotypes are more accessible (Galinsky & Moskowitz, 2000) and appears to even contribute to greater avoidance of the stereotyped group (Macrae, Bodenhausen, Milne, & Jetten, 1994).

This review has also identified several important notes of caution. While ACT interventions have generally been successful in targeting stigma, and outperformed active comparisons in several studies (Kenny & Bizumic, 2006b; Lillis & Hayes, 2007; Luoma et al., 2012; Minkesh & Masroor, 2014), their performance has been equivalent to active controls such as DBT (Clarke, Taylor, Bolderston, et al., 2015), psychoeducation (Clarke, Taylor, Lancaster, et al., 2015), or education (Masuda et al., 2007) in other trials. This suggests that ACT may be one of several types of interventions that are effective for stigma, and further research is needed to determine if it is more effective in specific areas or for attaining specific outcomes. Given the benefits of many existing stigma interventions (e.g., Paluck & Green, 2009), one future direction will be to evaluate interventions that combine ACT with other methods. For example, ACT may be used to enhance psychological flexibility and reduce negative reactions (e.g., defensiveness, avoidance) during contact interventions, education programs or other stigma interventions to maximize their impact (Levin, Lillis, & Biglan, 2015).

Unexpected findings such as an increase in malevolent attitudes after both ACT and education (Kenny & Bizumic, 2016b), higher internalized shame among substance users who received ACT relative to TAU at posttreatment (Luoma et al., 2012), and increased burnout and decreased psychological flexibility from pretreatment to posttreatment after an ACT intervention for staff working with clients with personality disorders (Clarke, Taylor, Bolderston, et al., 2015), also suggest that caution and care are needed in developing and implementing ACT interventions for stigma. Clarke, Taylor, Bolderston et al. (2015) interpret these findings by

suggesting that the ACT intervention may have provoked particularly strong emotional reactions in staff. It is possible that increasing awareness through ACT may initially lead to higher self-reports of difficult experiences like shame or burnout as a necessary step before changing one's relationship to those experiences. If this hypothesis is correct, it would suggest a need to be cautious in providing a sufficient dosage of ACT to ensure that participants have the necessary skills to move forward with increased awareness of difficult experiences rather than getting stuck struggling with them.

Limitations and Future Directions

This review suggests several weaknesses in the current research on psychological flexibility, ACT, and stigma, which future studies should address. First, it would be advantageous to use well-validated measures of stigma. Several new measures of stigma have emerged such as the Internalized Stigma of Mental Illness Scale (ISMIS; Ritsher, Otilingam, & Grajales, 2003) and Substance Abuse Self-Stigma Scale (SASSS; Luoma et al., 2013) which may help to address this issue in some domains. It would also be beneficial to include more behavioral measures in studies on psychological flexibility and stigma. Because the goal of ACT for stigma is to help individuals pursue valued aims regardless of stigmatizing thoughts, measures that assess behavior change are more appropriate to evaluate these interventions compared to measures that focus on stigmatizing attitudes.

Future studies should also address the question of how ACT interventions impact psychological flexibility around stigma by directly by testing whether or not psychological flexibility moderates the effects of stigmatizing thoughts on problematic behavior. Further research in this area could also advance our understanding of how psychological flexibility is

related to stigma by systematically comparing its associations with self-stigma and stigma towards others, as well as the effects of ACT interventions on each of these.

The quality of research on ACT interventions for stigma could also be enhanced in several ways. The intervention studies conducted thus far have generally been small in sample size, particularly when considering specific domains of stigma. For example, only one study (with a sample of $n=5$) has been conducted on using ACT to target stigma related to sexual orientation. Therefore, while the results of that study are promising, it is too early to draw any conclusions about the appropriateness of ACT in this area. Another limitation to the currently published studies is that many studies have not used randomized control groups, and those that have used controls have often employed relatively basic ones such as education. Conducting large, randomized trials comparing ACT to an active control would greatly strengthen our ability to draw conclusions about ACT for stigma.

Rigorous tests of mediation and moderation could also greatly clarify the conditions under which ACT is effective and the processes through which ACT affects stigma. Conducting more analyses that meet the full criteria for mediation tests, and expanding these analyses to include not just psychological flexibility and believability, but acceptance, mindfulness, and values specifically, could help to clarify how the ACT model can best be applied with the goal of decreasing the effects of stigma on behavior. More research on long-term outcomes would also be worthwhile, as it appears that ACT may have different effects when compared to other interventions over the long term, but findings thus far are inconclusive.

There is some diversity in where these studies have been conducted, which provides an initial sign that the association between psychological flexibility and stigma is consistent in different cultures, and that these interventions may be effective in different cultural contexts.

However, given that stigma is closely linked to cultural beliefs and expectations, more research is also needed evaluating the role of psychological flexibility and testing ACT interventions for stigma in different cultural contexts.

This review has limitations that should be considered in interpreting its results. Only published articles were considered for inclusion, which ensures that the studies included have gone through the peer review process, but also heightens the risk of publication bias affecting the results. A more comprehensive search process of both published and unpublished literature could have potentially identified further research in this area. In addition, although the review methods are described in as much detail as possible, no systematic review protocol was developed for the present study, which may make evaluation and replication more difficult. Also, while study design and sample size were discussed in the current review, other potential sources of bias within studies, such as selective attrition or omission of nonsignificant outcomes were not evaluated. Future reviews in this area would be strengthened by incorporating thorough evaluation of bias at the study level.

Conclusions

ACT offers a new way to conceptualize stigma, in which stigmatizing thoughts are only considered problematic to the extent that they are allowed to dominate behavior. Sixteen studies have tested associations between measures of psychological flexibility and stigma. A meta-analysis of these findings suggested that psychological inflexibility is meaningfully associated with stigma, and these findings are consistent across a broad range of domains.

In accordance with this model, ACT also provides a new perspective on stigma interventions and as a result uses different techniques to achieve its aims compared to many interventions. In this review, 15 studies were identified that tested an ACT intervention for self-

stigma or stigma towards others. The results of ACT interventions for stigma are generally promising thus far, both in regard to outcomes and in supporting theorized mechanisms of change. However, this area of research is relatively new and is hampered by small sample sizes as well as a lack of well-validated measures. This is an area that warrants attention for presenting a novel method for addressing stigma and showing notable potential in achieving long-term reductions in stigma even following relatively low-dose interventions.

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Table 1: Summary of associations between psychological flexibility and stigma

Author and year	Population	Sample size	PI measure	Stigma measure(s)	Correlation
Chan & Mak (2015)	Individuals with mental illness in Hong Kong	n=189	Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011)	Self-stigmatizing Thinking's Automaticity and Repetition Scale (STARS; Chan & Mak, 2015, adapted from Verplanken et al., 2007) Self-Stigma Scale-Short Form (SSS-SF; Mak & Cheung, 2010)	0.69*** 0.52***
Gold et al. (2007)	Gay male sexual assault survivors	n=74	Acceptance and Action Questionnaire (AAQ; Hayes, Strosahl et al., 2004)	Revised Nungesser Homosexuality Attitudes Inventory (RNHAI; Shidlo, 1994)	0.47***
Heersink et al. (2015)	Individuals with epilepsy	n=101	Acceptance and Action Epilepsy Questionnaire (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996)	Stigma Scale (SS; Jacoby, 1994)	0.52***
Levin et al. (2014)	Undergraduate students	n=604	AAQ-II Acceptance and Action Questionnaire-Stigma (AAQ-S; Levin et al., 2014);	Bogardus Social Distance Scale (SDS; Bogardus, 1925) Scale of Ethnocultural Empathy (SEE; Wang et al., 2003) SDS SEE	0.02 0.03 0.33*** 0.38***
Lillis et al. (2010)	Individuals with BMI ≥ 25 seeking treatment for weight loss Combined sample of individuals with BMI ≥ 25 , treatment seeking and non treatment seeking	n=84 n=169	AAQ Acceptance and Action Questionnaire for Weight (AAQ-W; Lillis & Hayes, 2008)	Weight Self-Stigma Questionnaire (WSSQ; Lillis, Luoma, Levin, & Hayes, 2010)	0.51** 0.76**
Luoma et al. (2007)	Individuals in residential or outpatient treatment for substance use	n=197	AAQ	Substance Abuse Perceived Stigma Scale (SAPSS; Luoma et al., 2007; adapted from Link, 1987) Stigma-Related Rejection Scale (SRS; Luoma et al., 2007; adapted from Wahl, 1999) Internalized Shame Scale (ISS; Cook, 1996)	0.12 0.29*** 0.56***
Luoma et al. (2008)	Individuals in residential treatment for substance use	n=30	AAQ (early version)	ISS	0.70*** (at post-treatment)
Luoma et al. (2010)	Individuals in inpatient or outpatient treatment for substance use	n=238	Experiential avoidance; measure not reported	Perceived Stigma of Addiction Scale (PSAS; Luoma et al., 2010; adapted from Link et al., 1997)	0.27***
Luoma et al. (2011)	Individuals in residential or outpatient treatment for substance use	n=122 n=109 n=273	Acceptance and Action Questionnaire-Substance Abuse (AAQ-SA; Luoma et al., 2011)	ISS Internalized Stigma of Substance Abuse (ISSA; Luoma et al., 2008) ACS: Active Coping with Stigma (ACS; Luoma et al.,	0.42*** 0.52*** 0.30***

				2011)	
Luoma et al. (2013)	Individuals in residential or outpatient treatment for substance use	n=334 n=270	AAQ AAQ-SA	Substance Abuse Self-Stigma Scale (SASSS; Luoma et al., 2013)	0.51*** 0.61***
Masuda & Latzman (2011)	Undergraduate students	n=573	Acceptance and Action Questionnaire-16 (AAQ-16; Hayes, Strosahl, et al., 2004)	Stigmatizing Attitudes-Believability (SAB; Masuda et al., 2009) - Exclusion subscale SAB - Course/Origin subscale	0.10** 0.24**
Masuda et al. (2009)	Undergraduate students	n=297	AAQ-16	Day's Mental Illness Stigma Scale—Anxiety (DMISS-A; Day, Edgren, & Eshleman, 2007) SAB (Masuda et al., 2009)	0.30*** 0.24***
Palmeira, Cunha, et al. (2016)	Women from general population and overweight or obese women seeking treatment	n=425	AAQ-II AAQW-R : Acceptance and Action Questionnaire for Weight-Revised (Palmeira, Cunha, et al., 2016)	Other as Shamer Scale – Brief (OAS-2; Matos, Pinto-Gouveia, Gilbert, Duarte, & Figueiredo, 2015)	0.59*** 0.47***
Palmeira, Pinto-Gouveia, et al. (2016)	Overweight or obese women seeking treatment	n=282	AAQW-R	WSSQ	0.61***
Rüsch et al. (2006)	Women with borderline personality disorder and women with social phobia in Germany	n=90	AAQ	Perceived Stigma Questionnaire - (PSQ; Link et al., 1989; German version: Angermeyer, Unpublished); - Perceived Discrimination PSQ - Withdrawal Self-Stigma of Mental Illness Scale (SSMIS; Corrigan et al., 2006; German version: Rüsch and Brück, Unpublished) - Stereotype Awareness SSMIS - Stereotype Agreement SSMIS - Self-Concurrence SSMIS - Self-Esteem Decrement	0.18 ¹ 0.34*** ¹ 0.16 ¹ 0.24* ¹ 0.46*** ¹ 0.48*** ¹
Webb & Hardin (2016)	Female undergraduate students	n=333	Body Image Acceptance and Action Questionnaire (Sandoz et al., 2013)	WBIS-M: Modified Weight Bias Internalization Scale (Pearl & Puhl, 2014) Body Image Shame Scale (BISS; Duarte et al., 2015)	0.81** 0.75***

*p<.05

**p<.01

***p<.001

¹ Partial correlations controlling for depression.

Table 2: Summary of ACT interventions for stigma

Author and year	Type of stigma targeted	Sample size ¹	Outcomes	Sig. within-condition improvement at post?	Improved/maintained at follow-up?
Berman et al. (2016)	Obesity-related stigma in the obese	n=18	Depressive symptoms Physical activity Systolic blood pressure Diastolic blood pressure Obesity-related quality of life Body image acceptance Obesity-related stigma	Y N Y ² N Y Y Y	Y N Y ² Y Y Y
Clarke, Taylor, Bolderston, et al. (2015)	Attitudes of health care staff towards individuals with personality disorders	n=53 (ACT) n= 47 (DBT)	Attitudes toward personality disorder patients Staff-perceived quality of therapeutic relationship Staff distancing Staff psychological distress Staff burnout Staff psychological flexibility	Y Y Y N N N	Y Y Y N N N
Clarke, Taylor, Lancaster, et al. (2015)	Attitudes of service provider staff towards individuals with personality disorders	n=57 (ACT) n=49 (PET)	Attitudes toward personality disorder patients Staff-perceived quality of the therapeutic relationship Staff distancing Staff distress Staff burnout Staff values-actions discrepancy	Y Y Y N N Y	Y Y Y N N N
Hayes, Bissett, et al. (2004)	Attitudes of drug abuse counselors towards patients	n= 30 (ACT), n=34 (multicultural training), n=29 (educational control)	Stigmatizing attitudes toward substance users Burnout Believability of stigmatizing attitudes (process measure)	N Y Y	Y Y Y
Kenny & Bizumic (2016b)	Attitudes toward people with mental illness	n=71 (ACT) n=81 (education)	Stigmatizing attitudes toward people with a mental illness	Y	N/A
Lillis & Hayes (2007)	Racial prejudice	n=32	Positive action intentions	Y	Y
Lillis et al. (2009)	Obesity-related stigma in the obese	n=84	Psychological distress Obesity-related quality of life Weight stigma Weight Psychological inflexibility (process) Weight-related psychological flexibility (process) Distress tolerance (process)	N/A	Y Y Y Y Y Y
Luoma et al. (2008)	Self-stigma of substance users	n=88	Internalized shame Internalized stigma Overall mental health Stigma-related rejection Self concealment Total social support Family social support Sig. other social support Friends social support Self-esteem Perceived stigma Believability of stigmatizing attitudes (process) Psychological inflexibility (process) Believability of reasons for using (process)	Y Y Y N N N N N N N Y N N Mixed ³ N	N/A
Luoma et al. (2012)	Internalized shame (in substance)	n=68 (TAU+ACT) n=65 (TAU)	Internalized shame Treatment utilization Drug and alcohol use	Y N/A Y	Y Y N/A

	users)		Overall mental health Quality of life Social support	Y Y N	Y Y Y
Masuda et al. (2007)	Mental health stigma	n=52 (ACT) n=43 (education)	Attitudes toward people with a mental illness Psychological flexibility (process)	Y N	Y N
Masuda et al. (2009)	Mental health stigma	n=22	Attitudes toward people with a mental illness	Y	Y
Minkesh & Masroor (2014)	Internalized stigma among individuals with schizophrenia	n=10 (TAU) n=10 (TAU+ACT)	Internalized stigma of mental illness	Y	Y
Moitra et al. (2015)	HIV stigma	n=8	Care engagement Psychological flexibility Depression HIV stigma Distrust of the health care system	N/A	N/A
Skinta et al. (2015)	Internalized HIV-related stigma	n=3	Internalized HIV-related stigma Psychological flexibility (process)	N/A	N/A
Yadavaia and Hayes (2012)	Self-stigma around sexual orientation linked to same-sex attraction	n=5	Frequency of thoughts Believability of thoughts Distress about thoughts Interference of thoughts Internalized homonegativity/homophobia Depression Anxiety Stress Quality of life Perceived social support Overall psychological flexibility	N Y Y Y N Y N N N Y N	N/A N/A N/A N/A N Y N Y N ⁴ Y Y N ⁴

¹Sample sizes are reported for number of participants analyzed from pre to post for each study.

²RM ANOVA indicated that this measure improved over time; however, the timing of change is unclear.

³Two versions of the AAQ were used for different subsamples; psychological flexibility improved significantly in one subsample and deteriorated in another.

⁴These outcomes had improved at 4-week follow-up but not at the final 12-week follow-up.

Figure 1. Inclusion process flow diagram for Study 1

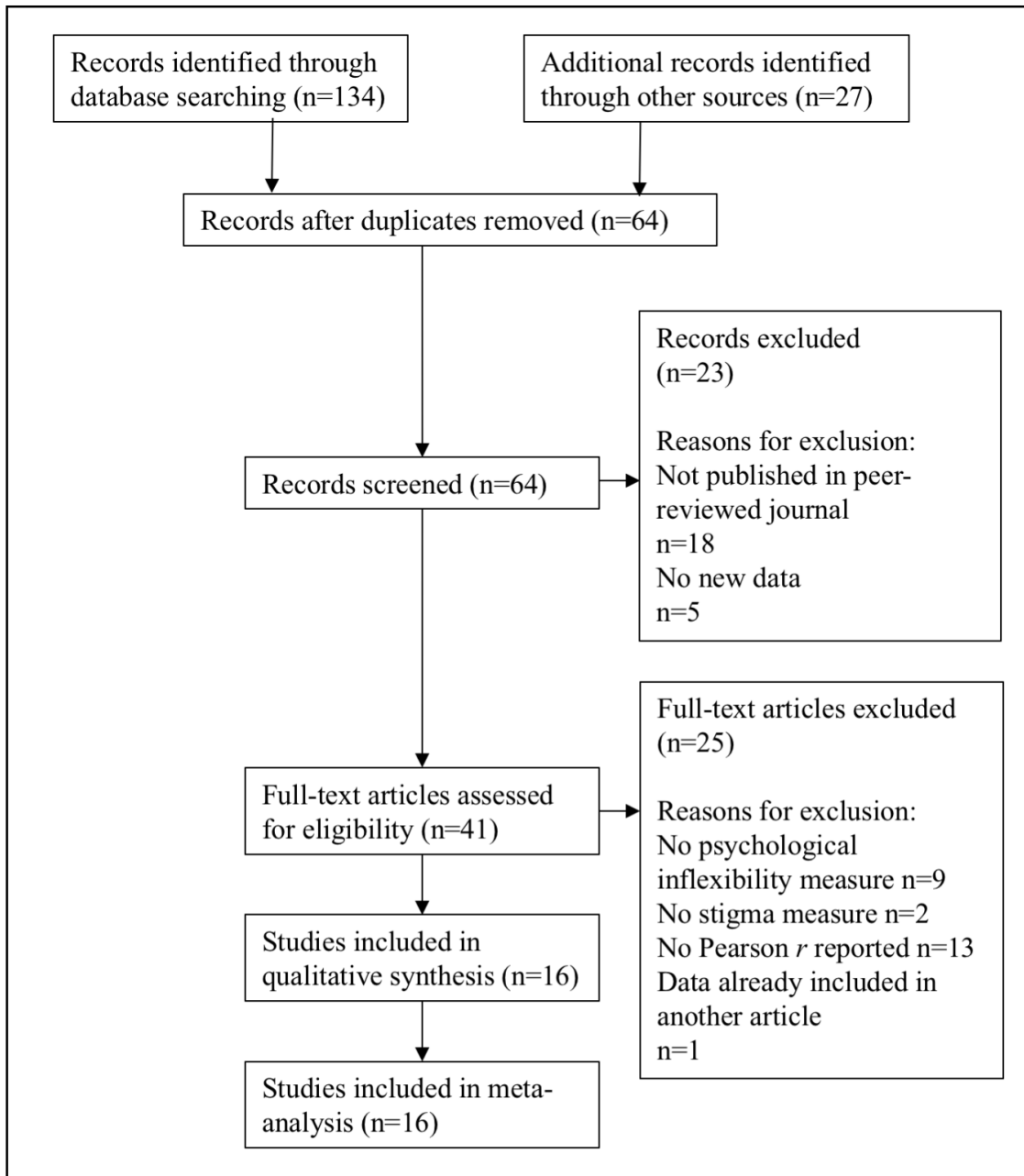


Figure 2. Forest plot for Study 1

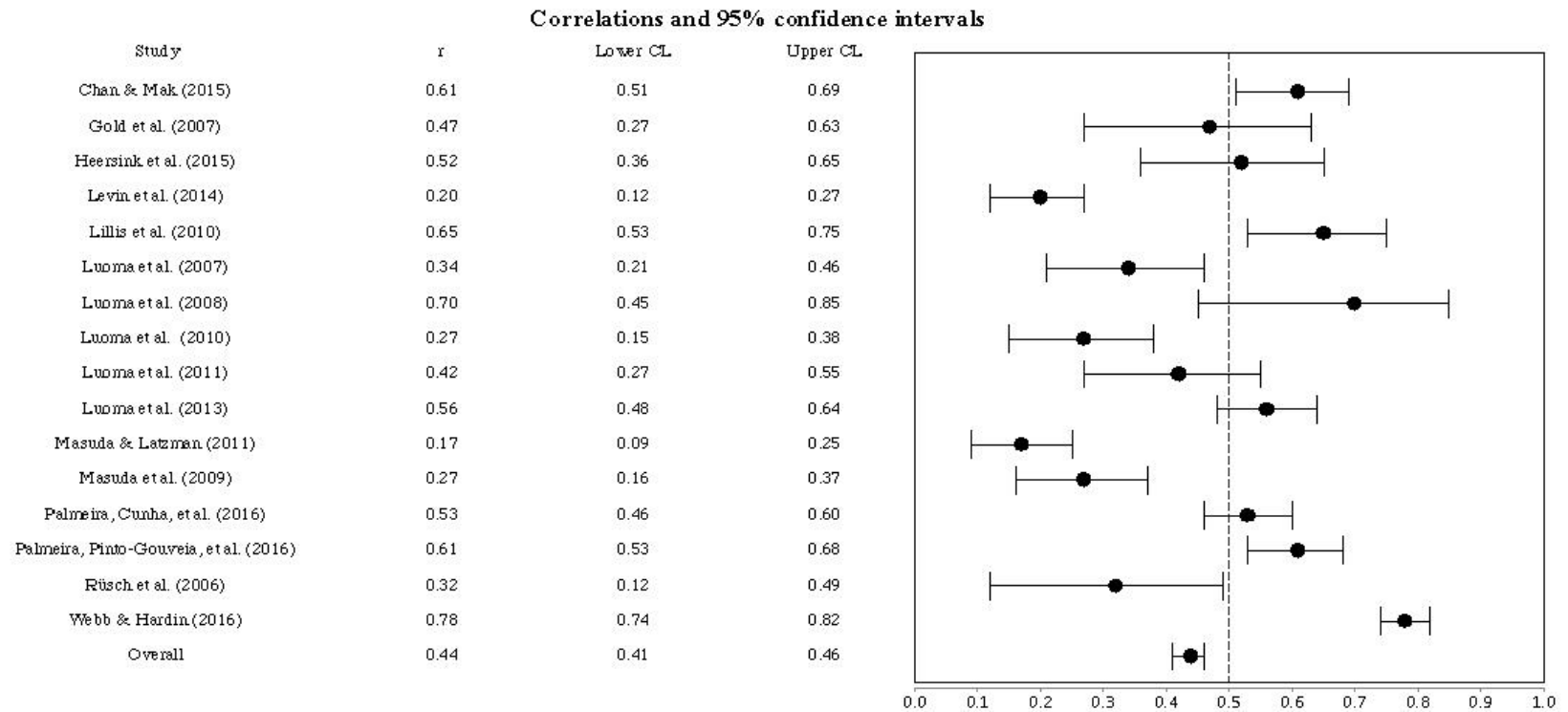


Figure 3. Inclusion process flow diagram for Study 2

