



Attrition from self-directed interventions: Investigating the relationship between psychological predictors, intervention content and dropout from a body dissatisfaction intervention

Adam W.A. Geraghty^{a,*}, Alex M. Wood^b, Michael E. Hyland^c

^a School of Psychology, University of Southampton, Southampton, UK

^b School of Psychological Sciences, University of Manchester, Manchester, UK

^c School of Psychology, University of Plymouth, Plymouth, UK

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ABSTRACT

The aims of this study were to (a) identify the predictors of attrition from a fully self-directed intervention, and (b) to test whether an intervention to increase gratitude is an effective way to reduce body dissatisfaction. Participants ($N = 479$, from the United Kingdom) aged 18–76 years took part in a self-help study via the Internet and were randomized to receive one of two interventions, gratitude diaries ($n = 130$), or thought monitoring and restructuring ($n = 118$) or a waitlist control ($n = 231$) for a two week body dissatisfaction intervention. The gratitude intervention ($n = 40$) was as effective as monitoring and restructuring ($n = 22$) in reducing body dissatisfaction, and both interventions were significantly more effective than the control condition ($n = 120$). Participants in the gratitude group were more than twice as likely to complete the intervention compared to those in the monitoring and restructuring group. Intervention content, baseline expectancy and internal locus of control significantly predicted attrition. This study shows that a gratitude intervention can be as effective as a technique commonly used in cognitive therapy and is superior in retaining participants. Prediction of attrition is possible from both intervention content and psychological variables.

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Self-directed interventions have the potential to substantially increase access to health improvement strategies (Bennett & Glasgow, 2009). Provision via the Internet allows for a significant reduction in costs associated with intervention administration (Muñoz & Mendelson, 2005). Self-directed interventions have been evaluated and shown to be beneficial for a broad range of health challenges including smoking cessation and diabetes management (McKay, Glasgow, Feil, Boles, & Barrera, 2002; Muñoz et al., 2006) as well as medical and psychological conditions including obesity, depression and body dissatisfaction (Christensen, Griffiths, Mackinnon, & Brittliffe, 2006; Hrabosky & Cash, 2007; Latner & Wilson, 2007). However, when these interventions are fully self-directed, that is, without human contact or guidance, attrition is consistently high (Eysenbach, 2005). From a methodological perspective, attrition compromises internal and external validity. From a health care systems perspective, attrition represents a behavior that can inform our understanding of psychological processes that are important to health outcome. An understanding of

the underlying processes of attrition will help guide the creation of interventions that prevent dropout (Davis & Addis, 1999). In this paper we have two aims. First we model predictors of attrition using an Internet-administered intervention to reduce body dissatisfaction. We test the prediction of attrition from person-based psychological variables (health locus of control and outcome expectancy) and intervention content (thought monitoring and restructuring vs. gratitude). Second, we test whether a brief gratitude intervention successfully reduces body dissatisfaction compared to thought monitoring and restructuring intervention and a waitlist control.

Definitions of attrition vary from non-completion of follow-up measures, early dropout/late dropout distinctions (Davis & Addis, 1999) to 'nonusage attrition' in Internet interventions, where participants may stop using the intervention but still provide post-intervention data (Eysenbach, 2005). All forms of attrition are likely to be related however, in part representing 'disenchantment' with intervention content (Eysenbach, 2005), and more broadly disengagement from a goal to reduce a health-related problem. Unless otherwise stated, use of attrition in the current study refers to non-completion of post-intervention measures.

In fully self-directed interventions, high levels of attrition remain consistent across target symptom/behavior. Rabinus, Pike,

* Corresponding author. School of Psychology, University of Southampton, Southampton SO17 1BJ, United Kingdom. Tel.: +44 (0) 2380593995.

E-mail address: A.W.Geraghty@soton.ac.uk (A.W.A. Geraghty).

Wiatrek, and McAlister (2008) reported 62% attrition from an Internet based smoking cessation trial. Attrition from studies of fully self-directed therapies for depression and anxiety can be as high as 99% and 79.6% (Christensen et al., 2006; Farvolden, Denisoff, Selby, Bagby, & Rudy, 2005) and a study evaluating an unguided body image intervention reported dropout rates of 53% (Strachan & Cash, 2002). Despite high attrition rates, those participants who complete fully self-directed interventions consistently report significant improvements across targeted outcomes (Christensen, Griffiths, Korten, Brittliffe, & Groves, 2004; Etter, 2005; Farvolden et al., 2005; Muñoz et al., 2006). In addition, interventions without face-to-face contact may widen participation to those who would reject or avoid health improvement interventions with high levels of social interaction (Carlbring, Furmark, Steczko, Ekselius, & Andersson, 2006). Therefore, rather than abandon fully self-directed interventions due to high dropout, what is needed is increased study and management of the attrition process.

Predicting attrition

Identifying variables that predict attrition is critical (Bennett & Glasgow, 2009). With this information interventions can be manipulated, and individuals most at risk of dropout can be targeted with enhanced interventions or guidance and therapist contact. Attempts to predict attrition from unguided self-help trials have produced inconsistent results (Glasgow et al., 2007). This inconsistency is found not only in self-help research but also in studies that include face-to-face contact (see Davis & Addis, 1999). Age has been one of the more consistent demographic predictors of attrition from self-directed therapy, with being older increasing the chances of completion of post-intervention measures (Buller, Woodall, & Zimmerman, 2008; Couper, Peytchev, Strecher, Rothert, & Anderson, 2007). However, the relationship between age and intervention behavior is complex, and younger age has been related to greater use of intervention websites (Christensen, Griffiths, & Farrer, 2009).

In a review of attrition research, Davis and Addis (1999) suggested the need to supplement demographic predictors of attrition with psychological variables. Health locus of control has been considered an important psychological factor in attrition from face-to-face interventions (Bennett & Jones, 1986), and Mahalik and Kivlighan (1988) have suggested internal locus of control may be important in self-help therapy. Outcome expectancies are important determinants of behavior and have been reported as critical in psychotherapy for both outcome and engagement in the process (Hyland, Geraghty, Joy, & Turner, 2006; Hyland, Whalley, & Geraghty, 2007; Kirsch, 1999). Outcome expectancy may play a critical role in the decision to complete or disengage with a self-directed program, with low expectancies potentially leading to dropout. In this study we directly investigate internal health locus of control and outcome expectancy in an unguided or “pure” self-help context.

The relation between intervention content and dropout

Fully self-directed interventions feature two key components, (a) the core therapeutic content and (b) procedures and methods designed to encourage engagement with the therapeutic content and solicit feedback response such as follow-up methods. From the users' perspective, (a) is more important than (b). From the researcher's perspective (b) is more important than (a), for without (b) it is impossible to evaluate the effectiveness of the therapeutic content. In self-directed interventions for psychological symptoms, core therapeutic content is primarily based around cognitive

behavioral techniques. Researchers then implement complex cohort maintenance strategies in order to attempt to maintain interest in the core therapeutic content and obtain feedback responses. Both factors (a) and (b) are important from a research perspective; however, from a user's perspective (b) is less important. Previous research has addressed cohort maintenance (see Clarke et al., 2005). In this study we test whether altering the core therapeutic content alone will affect disengagement processes and increase retention in a brief self-directed body dissatisfaction intervention.

Body dissatisfaction is a common cause of distress in women (Cash & Henry, 1995), and is growing among men (McCabe & Ricciardelli, 2004). Body dissatisfaction can have a large impact on quality of life (Cash & Fleming, 2002) and lead to serious psychopathology such as body dysmorphic syndrome, bulimia, and anorexia (Stice & Shaw, 2002). As well as reductions in self-esteem, body dissatisfaction frequently results in restrained eating behaviors (Fett, Lattimore, Roefs, Geschwind, & Jansen, 2009). Therapeutic approaches currently used in body dissatisfaction interventions are inherently pathology focused. Cognitive Behavioral Therapy (CBT) techniques such as thought monitoring and restructuring involve working to correct negative assumptions about physical appearance. Jarry and Berardi (2004) and Jarry and Ip (2005) conducted a systematic review and a meta-analysis on stand-alone body image interventions where they surveyed body dissatisfaction, body image attitude, investment, and body image behavior and perception. They concluded that CBT approaches were effective; however they noted a distinct lack of alternative approaches and encouraged the investigation of differing techniques.

In order to test whether intervention content would significantly predict dropout, we compared two very different theoretical approaches. We chose thought monitoring and thought restructuring for one group. Identifying activating situations, negative thoughts (Cash (1997) refers to this as ‘private body talk’) and working to dispute and correct the problem thoughts are common techniques used in body image interventions (see Cash, 1997; Rosen, Reiter, & Orosan, 1995). An alternative intervention was drawn from the positive psychology literature. Cash (2002) has suggested that positive psychology – where focus is placed on positive experience and interpretations – may provide a useful framework for future body image research. The study of gratitude has shown the greatest potential for health applications (Bono, Emmons, & McCullough, 2004).

Gratitude is perhaps the quintessential positive psychology trait, being a “life orientation towards the positive” (Wood, Joseph, Lloyd, & Atkins, 2009, p. 43) involving a worldview towards noticing and appreciating the positive in life (Wood, Maltby, Stewart, & Joseph, 2008). Trait gratitude is strongly linked to well-being (Wood, Maltby, et al., 2008), positive coping (Wood, Joseph, & Linley, 2007), authenticity (Wood, Linley, Maltby, Baliouis, & Joseph, 2008), improved sleep (Wood et al., 2009), and naturally leads to lower stress and depression during a life transition (Wood, Maltby, Gillett, Linley, & Joseph, 2008). Given the benefits of being grateful, interventions have been developed to increase well-being through fostering gratitude (Emmons & McCullough, 2003). Although gratitude interventions were shown to increase well-being by Emmons and McCullough (2003), it is difficult to determine the broader efficacy of their intervention, as control groups used were not intended to be therapeutic. Geraghty, Wood, and Hyland (2010) conducted the first study to compare a gratitude intervention to cognitive therapy techniques, and showed that gratitude was equally effective in reducing worry. Gratitude may reduce body dissatisfaction through increasing positive affect and well-being; unhappiness has been found to invoke comparison with a gender stereotype of physical attractiveness (Barber, 2001), and low mood

has been shown to lead to body size overestimation and increases in body dysphoria (Baker, Williamson, & Sylve, 1995). Regularly reorienting to grateful experience may aid in the development of more functional positive schemas that may generalize to all aspects of experience, including body image. Importantly, keeping a gratitude diary, where daily gratitude events are recounted, may reflect a technique that is easy to sustain without guidance. Reorienting to the positive using gratitude may directly increase positive affect and be more reinforcing than attempting to correct negative body related thoughts, and thus lead to higher retention.

In this paper, we test whether person-based psychological variables (Health locus of control and expectancy), and intervention content (gratitude or restructuring) predict dropout from a two-week body dissatisfaction intervention. Additionally we test the effectiveness of a gratitude intervention compared to monitoring and cognitive restructuring for body dissatisfaction. We included two waitlists to test whether waiting for monitoring and restructuring, or waiting for gratitude diaries influenced dropout from the waitlist. We hypothesized that as the study was automated and included no guidance, internal locus of control and outcome expectancy may predict attrition. We also hypothesized that intervention content would significantly predict dropout, in the direction that allocation to the gratitude condition would increase probability of completion. Reorienting to gratitude may be a more reinforcing experience than correcting thoughts, leading to increased behavioral maintenance.

Method

Participants

Participants, including 458 females and 21 males volunteered via the Internet. The sample age ranged between 18 and 76 with a mean of 36 ($SD = 10$) with 37% aged from 18 to 30, 52% from 31 to 50 and 11% from 51 to 76. Information about the study including the website was placed in local newspapers in the South West of England, and on weight loss websites. Notices offered the chance to receive Internet-administered self-help techniques for body dissatisfaction free of charge. This was an open access study of spontaneous users, with the limitation that participants had to be over the age of 18 and not currently undergoing treatment for a psychological disorder to be eligible to take part. Participants were included with all levels of body dissatisfaction. Participants were recruited into the study from May 2007 until November 2007. Ethics approval was obtained from the University of Plymouth Research Ethics Committee.

Procedure

Participants visited a website where they completed all baseline measures and were randomized to one of four conditions (see Fig. 1). Randomization occurred automatically according to a computer generated true randomization list. All participants read a description of their allocated intervention and rated the extent they expected it to reduce body dissatisfaction. Participants in the intervention conditions downloaded a workbook at this point. The workbooks were brief, approximately 19 pages each, with four pages introducing ideas about body image and describing the technique, two pages of example sheets and then 14 clear worksheets. Participants were asked to complete exercises from the workbook each day. They were sent fully automated daily reminder emails that allowed them to return to a web system where they recorded how much time they had spent on their workbook, and after the first day, how difficult they found their allocated technique. Participants were not contacted personally via email by the

researchers. After 14 days they were automatically sent an email containing a link to the final body image measures. When the participants had completed the final measures they read through a debriefing page. After they had completed all baseline measures, participants in the waitlist conditions were informed that they would be able to download their workbook in two weeks time. After 14 days these participants were sent an email asking them to complete the body dissatisfaction measures. They were then able to download a workbook. Waitlist participants were then given the opportunity to complete the study in the same way as participants in the intervention conditions. The study was entirely without human contact, and participants were offered no incentives to complete the study other than the potential of therapeutic benefit.

Interventions

Monitoring and restructuring (MR)

The monitoring and restructuring workbook included an account of the nature of body dissatisfaction and its potential causes, and a description of why thought monitoring and thought restructuring exercises will help to reduce body dissatisfaction. The participants were asked to complete Automatic Thought Records (ATR) each day. The workbook contained a description of how to complete the thought records, and then 14 thought records with two examples of completed sheets. Participants recorded the situation they were in when they felt dissatisfied with their body and the negative thoughts they had at the time. They then practiced providing support for and against their negative thoughts, and finally thinking in a more neutral, balanced way. The thought records provided both self-monitoring: participants become aware of their negative thoughts and beliefs regarding their body; and restructuring: participants practice thinking in alternative more balanced ways regarding their bodies. In this regard it is a CBT technique that is very common in self-help interventions for depression (Greenberger & Padesky, 1995) and anxiety as well as body dissatisfaction (Jarry & Ip, 2005).

Gratitude diaries (GD)

The gratitude workbook contained the same account of the nature of body dissatisfaction and its potential causes as the Monitoring and Restructuring workbook, but a different rationale was described for how gratitude would reduce body dissatisfaction. The workbook informed participants of the benefits of practicing daily gratitude, including the positive effects that expressing gratitude could have on well-being. They were informed that as their general well-being increased they would begin to feel more satisfied with their body. Orienting attention to all they have, and what is good in their life, would lead to increased body satisfaction. Participants were asked to complete gratitude diaries, lists of up to 6 things they felt grateful for, daily for two weeks. Examples were given such as "I am grateful for having loving parents" and "I am grateful for an interesting job". Gratitude diaries were shown by Emmons and McCullough (2003) to significantly improve well-being over a two week period.

Waitlist conditions (WL)

Participants in the waitlist conditions completed all baseline measures (including body dissatisfaction measures) and were informed that they had been randomized to either the Monitoring and Restructuring condition or the Gratitude condition. They were then told they would be asked to start in two weeks time. Participants that completed the wait period completed body dissatisfaction measures again and had the opportunity to complete the workbooks in the same way as participant in the intervention conditions.

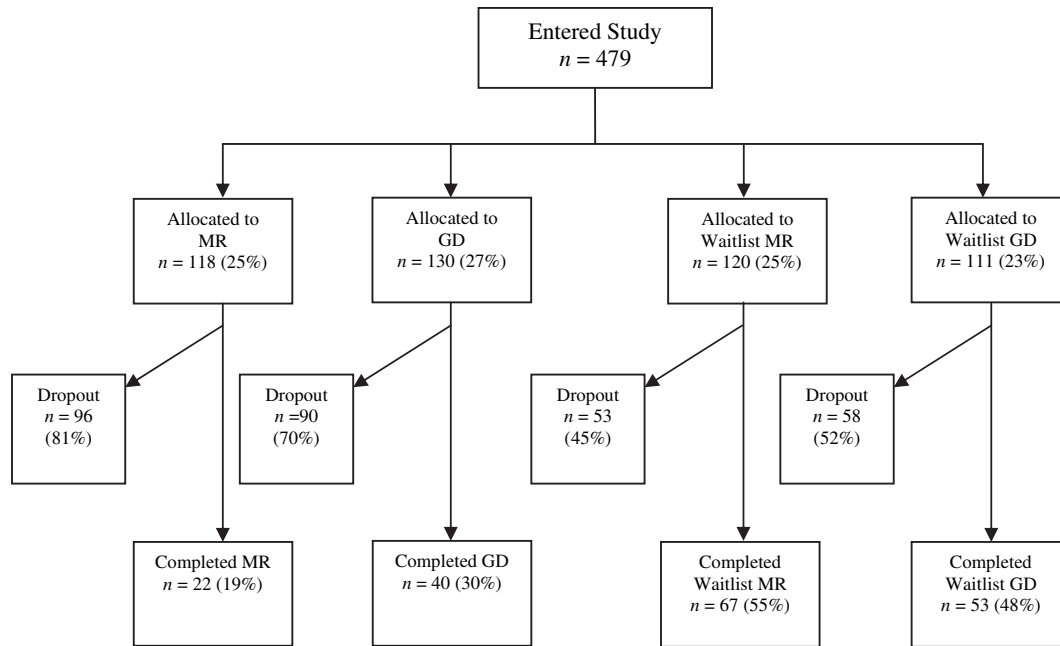


Fig. 1. Flow of participants through study (GD = Gratitude Diaries; MR = Thought Monitoring and Restructuring).

Measures

Attrition

Attrition was defined as non-completion of post-intervention measures. All participants completed baseline measures in full, and were randomized to either intervention conditions or waitlist controls. Only participants who provided both pre and post-intervention measures were classed as completers.

Body dissatisfaction

Body dissatisfaction was measured using two subscales from the Multidimensional Body-Self Relations Questionnaire (MBSRQ-AS, Cash, 2000; Brown, Cash, & Mikulka, 1990). The Appearance Evaluation subscale (AE) consists of seven items that measure appraisals of appearance. Examples of items are "I dislike my physique" and "most people would consider me good looking". Items consisted of a 5-point Likert scale, with 1 as "definitely disagree" and 5 as "definitely agree". Internal consistency of this subscale was $\alpha = .83$ in the current study. The scale is one of the most frequently used scales in the body image field (Herbozo & Thompson, 2006). The Body Areas Satisfaction scale (BASS) consists of nine items that measure specific dissatisfaction with certain areas of the body. Participants are asked to use a 5-point scale from *very dissatisfied* to *very satisfied*, and rate areas of their body such as "face" and "mid torso (waist, stomach)". Items consisted of a 5-point Likert scale, with 1 as "very unsatisfied" and 5 as "very satisfied". Internal consistency for this sample was $\alpha = .77$. Both scales have good test-retest reliability ranging from .77 to .91 (Huang & Liu, 2008). On both subscales a higher score indicates higher body satisfaction.

Expectancy

Expectancy was measured by a single-item scale indicating the extent to which participants believed that their body dissatisfaction would be improved by taking part in the study. The question was "At this point in time, do you expect the workbook to help improve your body dissatisfaction?" Participants were asked to "circle the number that describes your opinion" on an 8-point scale with end

points labeled *I think it very unlikely it will help me* (1) and *Yes, I definitely expect it will help* (8).

Locus of control

Locus of control was measured using form A of the Multidimensional Health Locus of Control scale (MHLC, Wallston, Wallston, & DeVellis, 1978). The scale consists of 18 items classified into three subscales. Internal health locus of control, refers to the extent that an individual believes personal behavioral factors are responsible for their health. Chance locus refers to the belief that health is determined by luck or chance. Powerful others locus refers to the extent that an individual believes their health to be determined by powerful others, such as physicians. Each subscale contains six items rated on a six-point scale ranging from "strongly disagree" to "strongly agree". Internal consistency in the current sample was $\alpha = .77$ for internal, $\alpha = .71$ for chance, and $\alpha = .70$ for powerful other. Test-retest reliability has been reported as ranging from .65 to .75 (Wallston, 2005).

Adherence and difficulty

Adherence was measured via a daily email. Participants logged in and indicated on a single-item scale how much time they had spent on their workbook the previous day. The scale ranged from 1 to 6, with 1 indicating no time, 2 indicating 1–5 min, 3 indicating 5–10 min, 4 indicating 10–15 min, 5 indicating 15–20 min and 6 indicating over 20 min. Time spent on the workbook was chosen as a measure of adherence, as it is likely to reflect motivation to engage with the intervention to a greater extent than a simple measure of task completion. After the first day with the workbooks, in the same adherence email, participants were asked to rate how difficult they found completing their allocated technique on a 7 point scale with 1 representing "very difficult" and 7 "very easy".

Statistical analysis

Descriptive: To obtain an objective measure of severity of body dissatisfaction in our sample, z-deviation scores were created using the current baseline body dissatisfaction data and the norms presented by Cash (2000). Using the z-deviation scores we identified

the percentile of our sample mean on the distribution of norms for the body dissatisfaction measures. *Attrition*: Logistic regression models were used to analyze predictors of attrition. Initially, a logistic regression model was run for all participants who provided difficulty ratings after the first day with the workbook, in order to test whether initial perceived difficulty would predict attrition. Subsequently, all main effects of interest were entered into a regression model (continuous variables were standardized) for those in the intervention conditions. The regression model was then repeated for the waitlist conditions. *Outcome*: Multivariate analysis of covariance (MANCOVA) was used to determine differences in body dissatisfaction between groups. Baseline body dissatisfaction and gender were included as covariates; both severity and gender may affect body dissatisfaction outcomes. Given significant effects in the multivariate analysis, univariate analysis of covariance (ANCOVA) was used to determine the significant differences between groups (with both baseline body dissatisfaction and gender as covariates). This analysis was repeated twice, first for those who completed the interventions, and then for an intent-to-treat analysis (see Mazumdar, Liu, Houck, & Reynolds, 1999) to control for the bias of dropout on outcomes. We used a last case forward method of imputation, where participants' baseline measure was input where outcomes were missing. Where high dropout occurs this method provides a very conservative test of treatment strategy. Effect sizes were calculated using Cohen's *d*. Calculations of clinically significant change were based on Jacobson and Truax (1991) method 'C', where the level of functioning subsequent to intervention places the participant on the "normal side" of the halfway point between the dysfunctional mean and the norm mean. Thus, it is based on the relative likelihood of a particular score ending up in dysfunctional vs. functional population distributions (Jacobson & Truax, 1991).

Results

Descriptive

At baseline the sample mean on the body dissatisfaction subscale Appearance Evaluation was 2.2 ($SD = .78$, female norm = 3.36; Cash, 2000) with a z-deviation score of -1.33 that put the sample mean at the 9th percentile of the norms presented by Cash (2000). The baseline sample mean on the body dissatisfaction subscale Body Areas Satisfaction was 2.38 ($SD = .61$, female norm = 3.23; Cash, 2000) with a z-deviation score of -1.12 ; this placed the sample mean at the 12th percentile of the sample norms presented by Cash (2000). There were no outliers on either Appearance Evaluation or Body Areas Satisfaction at time one or time two (defined as observations greater than 1.5 inter-quartile ranges from the 1st and 3rd quartiles).

Adherence

Adherence measures for those who completed the study in each intervention condition showed that there were no significant differences in number of login days for either Gratitude ($M = 11.6$, $SD = 3.1$) or Monitoring and Restructuring ($M = 10.5$, $SD = 4.0$) $t(60) = -1.21$, $p = .23$. There were no significant differences in the amount of time participants reported spending on their workbook, Gratitude ($M = 2.7$, $SD = .84$) or Monitoring and Restructuring ($M = 2.8$, $SD = .68$) $t(60) = .59$, $p = .56$ indicating that participants in both conditions spent around 5–10 min on their workbook each day they recorded data. Neither days logged in nor reported amount of time spent on the workbook had a significant relationship with either post-treatment body dissatisfaction measure for those completing the study (all $ps > .05$).

Attrition

From the 479 participants who completed baseline measures 297 (62%) dropped out. In the workbook conditions, of the 248 participants allocated a workbook 186 (75%) dropped out and 62 (25%) completed outcome measures (11 males, 51 females). Of the 231 participants in the waitlist conditions 111 (48%) dropped out and 120 (52%) completed outcome measures (see Fig. 1).

One hundred and forty participants in the intervention groups provided difficulty data. Difficulty was not significantly related to dropout (Wald(1) = .39, Exp(B) .88, CI = .59–1.32, $p = .54$), and neither was an interaction between group and difficulty (Wald(1) = .32, Exp(B) 1.05, CI = .89–1.24, $p = .57$). A logistic regression model using all 248 participants in the intervention conditions can be seen in Table 1 (the waitlist logistic regression was conducted separately). In a first step we entered age, gender and baseline severity. None of these variables significantly predicted attrition. In a second step we added psychological variables including health locus of control variables, chance, powerful others, internal and expectancy. Both higher internal health locus of control and higher expectancy were significantly associated with completion. In a final step we added group, which significantly predicted attrition. Those receiving the gratitude intervention were 2.13 times more likely to complete the intervention than those receiving the monitoring and restructuring condition. To test the robustness of the predictions, the model was rerun with interaction terms, internal locus of control \times group, and expectancy \times group. Neither of the interactions was significant (interaction step $\chi^2 = 1.15$, $df = 2$, $p = .56$). Further interaction terms were also tested including internal locus of control \times baseline Body Areas Satisfaction, expectancy \times baseline Body Areas Satisfaction, internal locus \times gender, expectancy \times gender, group \times gender, and finally group \times baseline Body Areas Satisfaction. None of these interactions was significantly associated with attrition (all $ps > .05$) suggesting that internal health locus of control, expectancy and group were not moderated by either baseline body dissatisfaction or gender in predicting attrition. In a second model the same steps were followed for the waitlist conditions. All predictor variables and interactions were entered into a model simultaneously. None of the main effects or interactions predicted waitlist attrition (model $\chi^2(17) = 11$, $p = .83$).

Outcome

The MANCOVA revealed significant group differences on both Appearance Evaluation, $F(2,176) = 20.68$, $p < .001$; and Body Areas

Table 1

Logistic regression model of all baseline predictors with attrition as dependent variable (dropout = 0 complete = 1) in intervention conditions ($n = 248$).

Variable	Wald (df = 1)	Exp(B)	CI (95%)
Step 1			
Age ^a	.23	1.00	.97–1.03
Gender ^b	1.10	2.12	.51–8.67
T1 Body areas satisfaction ^a	.32	.83	.42–1.60
T1 Appearance Evaluation ^a	1.59	1.41	.83–2.39
Step 2			
Powerful Others HLOC ^a	.89	.59	.88–1.04
Chance HLOC ^a	.13	.98	.92–1.06
Internal HLOC ^a	4.32	1.08*	1.00–1.15
Expectancy ^a	3.91	1.39*	1.00–1.91
Step 3			
Group ^c	5.64	2.13*	1.14–3.96

Note: Step 1, $\chi^2 = 3.00$, $df = 4$, $p = .56$, Model Nagelkerke $R^2 = .02$; Step 2, $\chi^2 = 3.00$, $df = 4$, $p = .02$, Model Nagelkerke $R^2 = .08$; Step 3, $\chi^2 = 5.84$, $df = 1$, $p = .01$, Model Nagelkerke $R^2 = .12$. * $p < .05$.

^a Standardized variable.

^b Male, 1; Female, 2.

^c Worry diary, 0; Gratitude diary, 1.

Table 2

F tests, degrees of freedom (df) and significance levels for all comparisons using ANCOVA with baseline scores as covariates for all measures.

Comparison	Completer			Intent-to-treat		
	df	F	p	df	F	p
AE						
GD vs. WL	1, 157	42.66	$p < .001$	1, 359	18.22	$p < .001$
MR vs. WL	1, 139	15.27	$p < .001$	1, 345	5.66	$p < .05$
GD vs. MR	1, 59	.86	$p = .36$	1, 246	3.88	$p = .051$
BASS						
GD vs. WL	1, 157	36.01	$p < .001$	1, 359	14.51	$p < .001$
MR vs. WL	1, 139	24.85	$p < .001$	1, 345	7.22	$p < .01$
GD vs. MR	1, 59	.01	$p = .98$	1, 246	.65	$p = .42$

Note. AE = Appearance Evaluation; BASS = Body Areas Satisfaction; GD = Gratitude Diaries; MR = Monitoring and Restructuring; WL = Waitlist.

Satisfaction, $F(2,176) = 21.49$, $p < .001$, for those who completed the interventions. The intent to treat analysis confirmed the result of the completer analysis on Appearance Evaluation, $F(2,474) = 9.43$, $p < .001$; and Body Areas Satisfaction, $F(2,474) = 7.45$, $p < .01$. Post hoc ANCOVA was used to determine the differences between groups. Table 2 shows the F tests and significance levels for both body dissatisfaction measures. Table 3 shows pre-post means, standard deviations and effect sizes. Figs. 2 and 3 show completer pre-post means on Appearance Evaluation, and Body Areas satisfaction. Overall, both the gratitude diary and the monitoring and restructuring intervention were effective in significantly reducing body dissatisfaction, compared to the waitlist.^{1,2} There were no significant differences between the two interventions, both gratitude diaries and monitoring and restructuring interventions produced equivalent reductions in body dissatisfaction. The pre-post effect sizes for the completer analysis ranged from medium to large using Cohen's classifications (Cohen, 1988) that suggest .2 as a small effect, .5 as a medium effect and .8 as a large effect. Effect sizes for the intent to treat analysis were smaller, however this is to be expected when over 50% of the sample is entered as no change. In the gratitude diary condition 52% reached clinically significant change on Appearance Evaluation and 50% reached clinically significant change on Body Areas Satisfaction. In the monitoring and restructuring condition, 46% reached clinically significant change on Appearance Evaluation and 59% reached clinically significant change on Body Areas Satisfaction.

Discussion

Attrition occurs in all interventions and is not well understood (Bennett & Glasgow, 2009; Davis & Addis, 1999; Eysenbach, 2005). In this study we modelled predictors of attrition in the context of a brief body dissatisfaction intervention. Intervention content, expectancy and internal health locus of control significantly predicted attrition. Both gratitude diaries and monitoring and restructuring exercises

¹ There were no significant differences between the two waitlists, waiting for monitoring and restructuring or waiting for gratitude diaries, for both appearance evaluation, $F(1,117) = 2.66$, $p = .11$, effect size (Cohen's d) = $-.02$, and body areas satisfaction, $F(1,116) = 1.5$, $p = .210$, effect size (Cohen's d) = $-.08$, respectively. As no significant differences were found all subsequent analysis were conducted with one large pooled waitlist.

² Those in the waitlist were offered the chance to take part in the interventions received by those in the workbook conditions. For participants who completed (monitoring and restructuring, $n = 20$; gratitude diaries, $n = 15$) ANCOVA showed both workbooks were effective in equally reducing both appearance evaluation and body areas satisfaction, $ps < .001$, and there were no significant differences between the conditions on both appearance evaluation, $p = .79$, body areas satisfaction, $p = .73$.

Table 3

Means (SD) and effects sizes (Cohen's d) for all conditions on all measures.

Measure	Group	Completer			Intent-to-treat		
		Pre	Post	d	Pre	Post	d
AE	GD	2.34 (.70)	2.90 (.87)	.71	2.18(.74)	2.35(.86)	.21
	MR	2.39 (.71)	2.81 (1.02)	.48	2.29(.86)	2.37(.94)	.09
	WL	2.19 (.75)	2.17 (.75)	.03	2.20(.77)	2.15(.75)	.06
BASS	GD	2.57 (.60)	2.98 (.71)	.62	2.37(.66)	2.50(.75)	.18
	MR	2.38 (.57)	2.87 (.75)	.74	2.49(.64)	2.58(.69)	.14
	WL	2.35 (.57)	2.37 (.54)	.04	2.33(.61)	2.34(.59)	.02

Note. AE = Appearance Evaluation; BASS = Body Areas Satisfaction; GD = Gratitude Diaries; MR = Monitoring and Restructuring; WL = Waitlist.

significantly reduced body dissatisfaction for those who completed the intervention compared to waitlist controls.

Determinants of attrition

Participants in the waitlist conditions were more likely to complete the study than those who received interventions. This is to be expected. Participants in the waitlist condition are not required to do anything other than respond to follow-up measures after two weeks. Participants allocated to the gratitude intervention were more than twice as likely to complete the study than those allocated monitoring and restructuring. Retention was significantly increased without implementation of complex cohort maintenance strategies: participants were simply offered alternative therapeutic content.

Attrition was higher in the monitoring and restructuring condition compared with gratitude condition despite both interventions being effective in reducing body dissatisfaction. A possible explanation for the higher attrition is that the task of correcting negative thoughts may not be a pleasant experience in itself, increasing the likelihood of attrition without guidance. By contrast, the task of completing a gratitude diary may have led to increases in positive affect, making the whole experience pleasurable, more reinforcing and thus increasing retention. In designing unguided self-help interventions it is therefore necessary to identify therapeutic content that is not only effective, but engaging for the users.

Participants with higher expectations of beneficial outcome were significantly more likely to complete the intervention. Initial

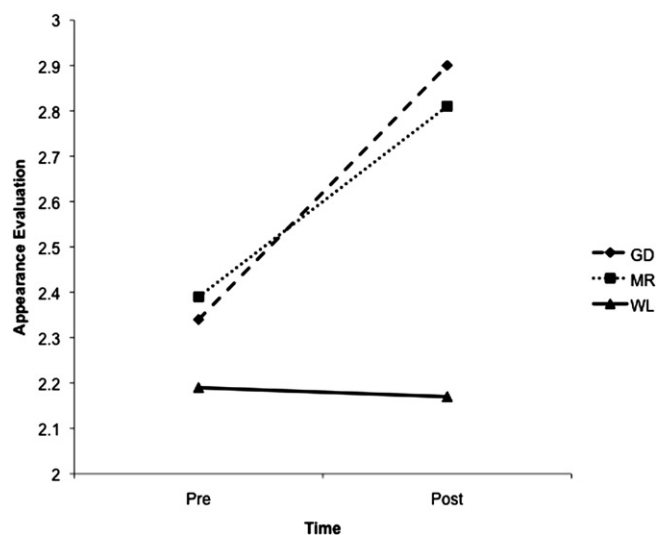


Fig. 2. Mean Body Areas Satisfaction scores before and after intervention for participants who completed all assessment measures ($n = 182$), GD = Gratitude Diaries, MR = Monitoring and Restructuring, WL = Waitlist.

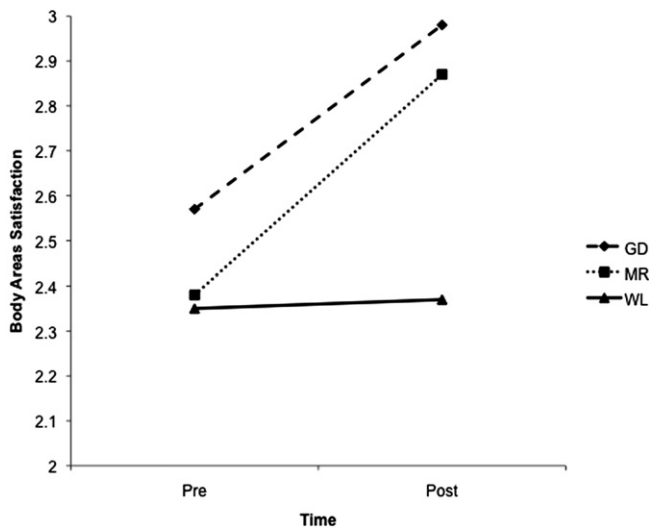


Fig. 3. Mean Appearance Evaluation scores before and after intervention for participants who completed all assessment measures ($n = 182$), GD = Gratitude Diaries, MR = Monitoring and Restructuring, WL = Waitlist.

expectancies are particularly important in fully self-directed interventions. In self-help health programmes with contact and guidance, low expectations may be subject to change by the researcher or therapist guiding the intervention (Kirsch, 1990). Our research suggests that when administering unguided interventions, close attention should be paid to enhancing expectation of beneficial outcome in the early or introductory stages of the intervention. Internal health locus of control was significantly associated with intervention completion. This research supports the theoretical association made by Mahalik and Kivlighan (1988) that those with more internally oriented locus of control should do better with self-help therapy. Wallston (1992) has suggested that health locus of control is a reflection of situationally determined beliefs rather than a trait measure. Therefore, interventions could feature components that enhance internal locus of control and expectancy, as well as treat the target outcome. Importantly, these psychological predictors were consistent across two interventions with very different content. This suggests this finding is robust and may generalize across varying interventions. Our study demonstrates that intervention content, expectancy and internal locus of control predict attrition; all are modifiable factors that have the potential to inform intervention design.

Interventions for body dissatisfaction

Previous research has shown that people who complete fully self-directed interventions report significant improvements in targeted symptoms (Christensen et al., 2006). Our study replicates this general finding. Both interventions significantly reduced body dissatisfaction compared to a waitlist. This is encouraging as it suggests therapeutic content can be manipulated and retention increased, without compromising outcome. A gratitude diary may be a useful component for body image interventions, and full randomized clinical controlled trials with follow up periods are needed. Our findings replicate those of Geraghty et al. (2010) and show that a gratitude diary can be as effective as cognitive techniques such as automatic thought records. Our research moves the study of gratitude in health interventions substantially forward, beyond student populations and control conditions not intended to be therapeutic.

The two therapeutic interventions used in our study may have reduced body dissatisfaction through different mechanisms.

Completing gratitude diaries may have caused reductions in body dissatisfaction through increases in positive interpretive biases; practicing daily gratitude may have led to more positive benefit appraisals (Wood, Maltby, et al., 2008). Completing the monitoring and restructuring intervention may have led to reductions in dissatisfaction by decreased negative body-related biases (Cash, 2002). Alternatively the interventions may bring about comparable changes through the same mechanisms. Frank and Frank (1991) and Wampold (2001) suggest that the most important factors required for beneficial therapeutic change are the provision of a functional explanation for the participants' distress and a planned course of action to ameliorate that distress, both of which act to reinstate hope. Consideration of these so-called 'common factors', that occur in all bona fide therapeutic interventions, may account for the findings in the broader literature showing that when two different body image interventions are compared, outcome equivalence consistently occurs (Fisher & Thompson, 1994; Hilbert & Tuschen-Caffier, 2004; Strachan & Cash, 2002). In addition, research on body dissatisfaction shows that 'non-specific' approaches can be effective; O'Dea (2004) reported significant improvements in body image following an intervention designed to increase self-esteem.

The common factors perspective has yet to be considered in the self-help domain. However, the suggestion that common factors and the broader therapeutic 'ritual' are more important than intervention specifics (Wampold, 2001) may explain the finding in the current study that reporting more time spent on the workbooks was not related to increased therapeutic outcome. It is also possible that contact, such as receiving reminders everyday, may have contributed to the effect of the intervention. Future research could apply 'active controls', where those in the waitlist also receive contact, to determine which components of self-help interventions are most potent.

This study has some limitations. Our finding of no significant outcome differences between the two approaches needs to be interpreted with caution at this stage. Studies with longer follow-up periods are needed. We did not measure BMI; future full clinical trials of positive interventions should include BMI to examine the relationship between body weight and the effect of interventions of body dissatisfaction. Our sample was largely female. As such we cannot generalize these results to a male population. The gender orientation of our sample reflects the gender bias in the prevalence of body dissatisfaction (McCabe & Ricciardelli, 2004), as well as the consistently documented finding that females are more likely to self-select for self-help programs (Neil, Batterham, Christensen, Bennett, & Griffiths, 2009).

In conclusion, fully self-directed therapy is often effective for those who complete the interventions. Understanding attrition is critical to develop interventions that users can engage with and sustain without guidance. This study suggests that self-directed interventions that focus on positive cognitions produce better retention than those that focus on negative cognitions. In addition, retention may be improved by enhancing expectancy for a successful outcome and internal locus of control.

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References

- Baker, J. D., Williamson, D. A., & Sylve, C. (1995). Body image disturbance, memory bias, and body dysphoria: effects of negative mood induction. *Behavior Therapy*, 26, 747–759.

- Barber, N. (2001). Gender differences in the effect of mood on body image. *Sex Roles*, 44, 99–108.
- Bennett, G. G., & Glasgow, R. E. (2009). The delivery of public health interventions via the internet: actualizing their potential. *Annual Review of Public Health*, 30, 273–292.
- Bennett, G. A., & Jones, S. E. (1986). Dropping out of treatment for obesity. *Journal of Psychosomatic Research*, 30, 567–573.
- Bono, G., Emmons, R. A., & McCullough, M. E. (2004). Gratitude in practice and the practice of gratitude. In P. A. Linley, & S. Joseph (Eds.), *Positive psychology in practice* (pp. 464–481). New Jersey: John Wiley & Sons.
- Brown, T. A., Cash, T. F., & Mikulka, P. J. (1990). Attitudinal body-image assessment: factor analysis of the body-self relations questionnaire. *Journal of Personality Assessment*, 55, 135–144.
- Buller, D. B., Woodall, W. G., & Zimmerman, D. (2008). Randomized trial on the 5 a Day, the Rio Grande Way website, a web-based program to improve fruit and vegetable consumption. *Journal of Health Communication*, 13, 230–249.
- Carlbring, P., Furmark, T., Steczko, J., Ekselius, L., & Andersson, G. (2006). An open study of Internet-based bibliotherapy with minimal therapist contact via email for social phobia. *Clinical Psychologist*, 10, 30–38.
- Cash, T. F. (1997). *The body image workbook: An 8-step program for learning to like your looks*. Oakland, CA: New Harbinger.
- Cash, T. F. (2000). *User's manual for the multidimensional body self-relations questionnaire*. Available from the author at <http://www.body-images.com>.
- Cash, T. F. (2002). Cognitive behavioral perspectives on body-image. In T. F. Cash, & T. Pruzinsky (Eds.), *Body image: Handbook of theory, research, and clinical practice* (pp. 38–46). New York: The Guilford Press.
- Cash, T. F., & Fleming, E. C. (2002). The impact of body-image experiences: development of the body image quality of life inventory. *International Journal of Eating Disorders*, 31, 455–460.
- Cash, T. F., & Henry, P. E. (1995). Women's body images: the results of a national survey in the U.S.A. *Sex Roles*, 33, 19–28.
- Christensen, H., Griffiths, K. M., & Farrer, L. (2009). Adherence in internet interventions for anxiety and depression. *Journal of Medical Internet Research*, 11, e13.
- Christensen, H., Griffiths, K. M., Korten, A. E., Brittliffe, K., & Groves, C. (2004). A comparison of changes in anxiety and depression symptoms of spontaneous users and trial participants of a cognitive behavior therapy website. *Journal of Medical Internet Research*, 6, e46.
- Christensen, H., Griffiths, K. M., Mackinnon, A. J., & Brittliffe, K. (2006). Online randomized controlled trial of brief and full cognitive behaviour therapy for depression. *Psychological Medicine*, 36, 1737–1746.
- Clarke, G., Eubanks, D., Reid, E., Kelleher, C., O'Connor, E., DeBar, L. L., et al. (2005). Overcoming Depression on the Internet (ODIN) (2): a randomized trial of a self-help depression skills program with reminders. *Journal of Medical Internet Research*, 7, e16.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Couper, M. P., Peytchev, A., Strecher, V. J., Rothert, K., & Anderson, J. (2007). Following up nonrespondents to an online weight management intervention: randomized trial comparing mail versus telephone. *Journal of Medical Internet Research*, 9, e16.
- Davis, M. J., & Addis, M. E. (1999). Predictors of attrition from behavioral medicine treatments. *Annals of Behavioral Medicine*, 21, 339–349.
- Emmons, R. A., & McCullough, M. E. (2003). Counting blessings versus burdens: an experimental investigation of gratitude and subjective well-being in daily life. *Journal of Personality and Social Psychology*, 84, 377–389.
- Etter, J. F. (2005). Comparing the efficacy of two Internet-based, computer-tailored smoking cessation programs: a randomised trial. *Journal of Medical Internet Research*, 7, e2.
- Eysenbach, G. (2005). The law of attrition. *Journal of Medical Internet Research*, 7, e11.
- Farvolden, P., Denisoff, E., Selby, P., Bagby, M. R., & Rudy, L. (2005). Usage and longitudinal effectiveness of a Web-based self-help cognitive behavioural program for panic disorder. *Journal of Medical Internet Research*, 7, e7.
- Fett, A. K., Lattimore, P., Roefs, A., Geschwind, N., & Jansen, A. (2009). Food cue exposure and body image satisfaction: the moderating role of BMI and dietary restraint. *Body Image*, 6, 14–18.
- Fisher, E., & Thompson, J. K. (1994). A comparative evaluation of cognitive behavioral therapy (CBT) versus exercise therapy (ET) for the treatment of body image disturbance. *Behavior Modification*, 18, 171–185.
- Frank, J. D., & Frank, J. B. (1991). *Persuasion and healing: A comparative study of psychotherapy*. Baltimore: Johns Hopkins University Press.
- Geraghty, A. W. A., Wood, A. M., & Hyland, M. E. (2010). Dissociating the facets of hope: agency and pathways predict dropout from unguided self-help therapy in opposite directions. *Journal of Research in Personality*, 44, 155–158.
- Glasgow, R. E., Nelson, C. C., Kearney, K. A., Reid, R., Ritzwoller, D. P., Strecher, V. J., et al. (2007). Reach, engagement, and retention in an Internet-based weight loss program in a multi-site randomized controlled trial. *Journal of Medical Internet Research*, 9, e11.
- Greenberger, D., & Padesky, C. A. (1995). *Mind over mood*. New York: The Guilford Press.
- Herbozo, S., & Thompson, J. K. (2006). Appearance-related commentary, body image, and self-esteem: does the distress associated with the commentary matter? *Body Image*, 3, 255–262.
- Hilbert, A., & Tuschen-Caffier, B. (2004). Body image interventions in cognitive-behavioral therapy of binge-eating disorder: a component analysis. *Behavior Research and Therapy*, 42, 1325–1339.
- Hrabosky, J. R., & Cash, T. F. (2007). Self-help treatment for body-image disturbances. In J. D. Latner, & G. T. Wilson (Eds.), *Self-help approaches for obesity and eating disorders: Research and practice* (pp. 118–138). New York: The Guilford Press.
- Huang, S., & Liu, H. E. (2008). Effectiveness of cosmetic rehabilitation on the body image of oral cancer patients in Taiwan. *Supportive Care in Cancer*, 16, 981–986.
- Hyland, M. E., Geraghty, A. W. A., Joy, O. E., & Turner, S. I. (2006). Spirituality predicts outcome independently of expectancy following flower essence self-treatment. *Journal of Psychosomatic Research*, 60, 53–58.
- Hyland, M. E., Whalley, B., & Geraghty, A. W. A. (2007). Dispositional predictors of placebo responding: a motivational explanation of flower essence and gratitude therapy. *Journal of Psychosomatic Research*, 62, 331–340.
- Jacobson, N. S., & Truax, P. (1991). Clinical significance: a statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology*, 59, 12–19.
- Jarry, J. L., & Berardi, K. (2004). Characteristics and effectiveness of stand-alone body image treatments: a review of the empirical literature. *Body Image*, 1, 319–333.
- Jarry, J. L., & Ip, K. (2005). The effectiveness of stand alone cognitive-behavioural therapy for body image: a meta-analysis. *Body Image*, 2, 317–331.
- Kirsch, I. (1990). *Changing expectations: A key to effective psychotherapy*. Pacific Grove, CA: Thomson Brooks/Cole.
- Kirsch, I. (1999). *How expectancies shape experience*. Washington, DC: American Psychological Association.
- Latner, J. D., & Wilson, G. T. (2007). *Self-help approaches for obesity and eating disorders: Research and practice*. New York: The Guilford Press.
- Mahalik, J. R., & Kivlighan, D. M. (1988). Self-help treatment for depression: who succeeds? *Journal of Counseling Psychology*, 35, 237–242.
- Mazumdar, S., Liu, K. S., Houck, P. R., & Reynolds, C. F., 3rd (1999). Intent-to-treat analysis for longitudinal clinical trials: coping with the challenge of missing values. *Journal of Psychiatric Research*, 33, 87–95.
- McCabe, M. P., & Ricciardelli, L. A. (2004). Body image dissatisfaction among males across the lifespan: a review of past literature. *Journal of Psychosomatic Research*, 56, 675–685.
- McKay, H. G., Glasgow, R. E., Feil, E. G., Boles, S. M., & Barrera, M. J. (2002). Internet-based self-management and support: initial outcomes from the Diabetes Network project. *Rehabilitation Psychology*, 47, 31–48.
- Muñoz, R. F., Lenert, L. L., Delucchi, K., Stoddard, J., Perez, J. E., Penilla, C., et al. (2006). Toward evidence-based Internet interventions: a Spanish/English web site for international smoking cessation trials. *Nicotine and Tobacco Research*, 8, 77–87.
- Muñoz, R. F., & Mendelson, T. (2005). Toward evidence-based interventions for diverse populations: the San Francisco General Hospital prevention and treatment manuals. *Journal of Consulting and Clinical Psychology*, 73, 790–799.
- Neil, A. L., Batterham, P., Christensen, H., Bennett, K., & Griffiths, K. M. (2009). Predictors of adherence by adolescents to a cognitive behavior therapy website in school and community-based settings. *Journal of Medical Internet Research*, 11, e6.
- O'Dea, J. A. (2004). Evidence for a self-esteem approach in the prevention of body image and eating problems among children and adolescents. *Eating Disorders*, 12, 225–239.
- Rabius, V., Pike, K. J., Wiatrek, D., & McAlister, A. L. (2008). Comparing internet assistance for smoking cessation: 13-month follow-up of a six-arm randomized controlled trial. *Journal of Medical Internet Research*, 10, e45.
- Rosen, J. C., Reiter, J., & Orosan, P. (1995). Cognitive-behavioral body image therapy for body dysmorphic disorder. *Journal of Consulting and Clinical Psychology*, 63, 37–44.
- Stice, E., & Shaw, H. E. (2002). Role of body dissatisfaction in the onset and maintenance of eating pathology: a synthesis of research findings. *Journal of Psychosomatic Research*, 53, 985–993.
- Strachan, M. D., & Cash, T. F. (2002). Self-help for negative body image: a comparison of components of a cognitive-behavioral program. *Behavior Therapy*, 33, 235–251.
- Wallston, K. A. (1992). Hocus-pocus, the focus isn't strictly on the locus: Rotter's social learning theory modified for health. *Cognitive Therapy and Research*, 16, 183–199.
- Wallston, K. A. (2005). The validity of the multidimensional health locus of control scales. *Journal of Health Psychology*, 10, 623–631.
- Wallston, K. A., Wallston, B. S., & DeVellis, R. (1978). Development of the multidimensional health locus of control (MHLC) scales. *Health Education and Behavior*, 6, 160–170.
- Wampold, B. E. (2001). *The great psychotherapy debate: Models, methods, and findings*. Hillsdale, NJ: Erlbaum.
- Wood, A. M., Joseph, S., & Linley, P. A. (2007). Coping style as a psychological resource of grateful people. *Journal of Social and Clinical Psychology*, 26, 1108–1125.
- Wood, A. M., Joseph, S., Lloyd, J., & Atkins, S. (2009). Gratitude influences sleep through the mechanism of pre-sleep cognitions. *Journal of Psychosomatic Research*, 66, 43–48.
- Wood, A. M., Linley, P. A., Maltby, J., Baliousis, M., & Joseph, S. (2008). The authentic personality: a theoretical and empirical conceptualization, and the development of the Authenticity Scale. *Journal of Counseling Psychology*, 55, 385–399.
- Wood, A. M., Maltby, J., Gillett, R., Linley, P. A., & Joseph, S. (2008). The role of gratitude in the development of social support, stress, and depression: two longitudinal studies. *Journal of Research in Personality*, 42, 854–871.
- Wood, A. M., Maltby, J., Stewart, N., & Joseph, S. (2008). Conceptualizing gratitude and appreciation as a unitary personality trait. *Personality and Individual Differences*, 44, 619–630.
- Wood, A. M., Maltby, J., Stewart, N., Linley, P. A., & Joseph, S. (2008). A social-cognitive model of trait and state levels of gratitude. *Emotion*, 8, 281–290.