Prognostic value of autonomous and controlled motivation in outpatient eating-disorder treatment

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Abstract
According to Self-Determination Theory, when motivation to reach an objective is fully internal, it is said to be “autonomous”; when driven by external incentives, it is said to be “controlled”. Previous research has indicated that autonomously motivated individuals show better response to treatments for eating disorders.

Objective: In individuals undergoing different intensities of outpatient treatment for an eating disorder, we sought to assess associations between autonomous and controlled motivations and response to treatment on the one hand, and likelihood of dropping out of treatment, on the other.

Method: Seven hundred seventy adults meeting DSM-5 criteria for an eating disorder (216 with Anorexia Nervosa, 282 with Bulimia Nervosa, and 272 with Other Specified Feeding or Eating Disorder) were included in this study. Before an interval of outpatient treatment, individuals completed the Eating Disorder Examination Questionnaire and the Autonomous and Controlled Motivations for Treatment Questionnaire. Participants completed the Eating Disorder Examination Questionnaire again at one or two subsequent timepoints.

Results: After controlling for diagnosis, treatment intensity, and number of previous treatments, analyses showed that higher autonomous motivation was associated with better response on eating-disorder overall symptoms and lower likelihood of dropping out of treatment. In contrast, controlled motivation was not associated with response to treatment.

Discussion: Our results suggest that autonomous motivation has trans-diagnostic influence upon response to various intensities of treatment for an eating disorder. In support of an autonomy supportive approach to treatment, findings link autonomous motivation with more favorable outcome.

KEYWORDS
anorexia nervosa, bulimia nervosa, feeding and eating disorders, motivation, treatment outcome

1 | INTRODUCTION

Although effective treatments exist for people with eating disorders (EDs; Fairburn, 2008; Lock & Le Grange, 2013; National Institute for Health and Care Excellence, 2004), a substantial proportion of affected individuals show disappointing treatment response. At least one fourth of individuals affected by Anorexia Nervosa (AN) or Bulimia Nervosa (BN) remain symptomatic in the months and years following an evidence-based treatment, and those who do not seek treatment tend to show negligible improvement over time (Sadock, Sadock, & Ruiz, 2015). Empirical data suggest that the egosyntonic nature of some ED symptoms, and resulting ambivalence about engaging in treatment, contribute to suboptimal treatment response, high attrition rates and chronicity (Castro-Fornieles et al., 2011; Fitzpatrick & Weltzin, 2014; Geller, Drab-Hudson, Whisenhunt, & Srikanmeswaran, 2004; Green et al., 2015; Hillen, Dempfle, Seitz, Herpertz-Dahlmann, & Buhren, 2015).

Research that has explored the relationship between motivation for treatment and ED outcome has often been inspired by the
This theory of motivation supposes that behavior change involves a progression through different stages of preparedness ranging from precontemplation, to contemplation, to preparation, to action, and to maintenance (Prochaska & DiClemente, 1992). Research in people with EDs has suggested that such stages of motivation for change are generally predictive of outcome by showing, for instance, that greater readiness for change is related to larger reductions in restraint and in bingeing behaviors. However, effects are stronger for some outcome dimensions than others. Evidence that motivational stages influence global ED symptomatology is weak, and there is literally no evidence that motivational stages impact purging behavior (Clausen, Lubeck, & Jones, 2013).

A smaller body of literature has investigated the relationship between ED outcome and motivation for treatment as described by Self-Determination Theory (SDT; Carter & Kelly, 2015; Mansour et al., 2012; Thaler et al., 2016; van der Kaap-Deeder et al., 2014). Although SDT is comparable to the transtheoretical model of change in many respects, rather than emphasizing stages of preparedness, SDT hypothesizes two independent types of motivation—autonomous and controlled (Deci & Ryan, 2000; Ryan & Deci, 2000). Autonomous motivation refers to a status in which individuals are personally engaged, and therefore feeling an intrinsic drive to change their behavior. Controlled motivation refers to circumstances in which individuals perceive external pressures to change, and change in response to an external incentive, to please someone else, or to avoid shame. Across various therapeutic situations, autonomous motivation has been associated with more sustained behavior change (Alfonsson, Johansson, Uddling, & Hursti, 2017; Koponen, Simonsen, & Suominen, 2017), while controlled motivation has been shown to inconsistently interfere with change (Eisenberg, Lipsky, Dempster, Liu, & Nansel, 2016). In ED research, autonomous motivation has been related to greater improvement in ED symptoms, whereas controlled motivation has not been found to influence ED-symptom change (Carter & Kelly, 2015; Mansour et al., 2012; Steiger et al., 2017; Thaler et al., 2016; van der Kaap-Deeder et al., 2014), although trend-level effects have been observed (Steiger et al., 2017).

The aim of the current study was to prospectively examine effects of pre-treatment autonomous and controlled motivation upon (a) trajectories of ED-symptom change during treatment and (b) treatment dropout. To our knowledge, the relationships between autonomous/controlled motivations and ED treatment dropout rates have never been investigated. Associations between motivation indices and measures of ED symptoms have been tested over shorter time spans than covered in the present study. Overall, identifying links between autonomous/controlled motivations and treatment outcome is important to determine whether autonomy supportive therapies have the potential to improve outcomes. Based on available findings, we hypothesized that higher autonomous motivation would be associated with greater reductions in overall ED symptoms and with reduced likelihood of premature treatment dropout. In parallel, we hypothesized that controlled motivation might, in keeping with SDT model, be linked to unfavorable outcomes.

2 | METHOD

2.1 | Participants

Participation in this institutional ethics board approved study was by informed consent. A total of 770 eligible individuals received outpatient treatment between January 2005 and March 2016 at the specialized Eating Disorder Program (EDP) of the Douglas Mental Health University Institute in Montreal, Canada, and agreed to take part in the study. All participants received an ED diagnosis based upon DSM-IV-TR or-5 criteria, following a semi-structured interview. For consistency purposes, DSM-IV-TR diagnoses were retrospectively updated to DSM-5 criteria using self-report symptoms reported on an Eating Disorder Examination Questionnaire (EDE-Q) completed before treatment. In rare cases (n = 43), the EDE-Q was only partially completed, and we instead used information retrieved by chart review or from the patient’s primary therapist.

To be eligible, individuals had to enter a 15–16-week segment of outpatient group treatment at the EDP and to meet diagnostic criteria for AN, BN, or other specified feeding or eating disorder (OSFED). Individuals with binge-eating disorder or requiring inpatient admission were excluded. Individuals who had been part of the Mansour et al. (2012) study were also excluded from the current study to avoid sample overlap.

2.2 | Design

This is a naturalistic observational study of a cohort of patients followed during treatment-as-usual at the EDP. At the beginning of treatment (Time 1), participants completed an EDE-Q and a questionnaire designed to measure motivational states (as described fully in the Measures section, to follow). At the end of treatment (Time 2), participants were invited to complete a second EDE-Q. To be considered as treatment completers (vs. dropouts), participants had to have participated in a minimum of 5 weeks of treatment—a point after which attrition-from-treatment rates diminished considerably. Analyses also included a subsample of participants who remained in treatment after the end of the 15–16-week treatment course and who completed an EDE-Q between 2 and 12 months following the initial therapy segment (Time 3). Use of this broad time window served to maximize the number of recordings.

Figure 1 depicts the flow of participants through the study. A total of 770 individuals completed Time 1 assessments, of whom 580 (75.3%) completed treatment, 133 (17.3%) dropped out of treatment, and 57 (7.4%) were lost to follow-up (meaning that we were not able to ascertain whether they were treatment completers or dropouts). Of the 580 treatment completers, 179 (30.9%) completed Time 2 and Time 3 questionnaires, 295 (50.9%) completed an EDE-Q at Time 2 only, and 106 (18.3%) completed neither Time 2 nor Time 3 questionnaires.

2.3 | Treatment

Outpatient treatment at the EDP combines individual and group therapy. Individual therapy consists of weekly or fortnightly 50-minute sessions with experienced clinicians specialized in EDs. In addition, three different group therapy intensities are available to patients. The
low-intensity outpatient group therapy entails 1.5-hr weekly sessions whereas day program and day hospital patients, respectively, meet for 6 hr and 10 hr per day, 4 days a week. Follow-up appointments with a psychiatrist and consultations with a nutritionist are offered as needed. Treatment at the EDP is standardized, manual-driven and integrates elements of psychoeducation, autonomy support, cognitive behavioral, dialectic behavioral, and interpersonal therapies (Steiger, 1999, 2017).

2.4 | Measures

**Autonomous and Controlled Motivations for Treatment Questionnaire (ACMTQ):** The ACMTQ is a 12-item self-rated questionnaire adapted from the Treatment Self-Regulation Questionnaire (Williams, Freedman, & Deci, 1998a; Williams, Rodin, Ryan, Grolnick, & Deci, 1998b) by Zuroff et al. (2007) to assess controlled and autonomous motivations in depression. The ACMTQ was later adjusted to EDs by Mansour et al. (2012) and has since been utilized in several ED treatment studies (Carter & Kelly, 2015; Steiger et al., 2017; Thaler et al., 2016). The ACMTQ contains two six-item subscales, one assessing autonomous motivation and the other evaluating controlled motivation. Each question is rated on a 7-point Likert scale going from "strongly disagree" to "strongly agree." A mean score for each type of motivation is computed, that varies between 1 (low motivation) and 7 (high motivation). Cronbach’s alphas of .85 for autonomous motivation and 0.81 for controlled motivation were found in the current study.

**Eating Disorder Examination Questionnaire (EDE-Q):** Fairburn & Beglin, 1994): The EDE-Q is a 36-item self-report questionnaire assessing the severity of eating symptoms in four spheres: restraint, weight concerns, shape concerns, and eating concerns. Mean scores are derived for each subscale and are then combined in one global mean score ranging from 0 (low severity) to 6 (high severity). All subscales are demonstrated to have acceptable construct reliability (0.66–0.94) and internal consistency (Cronbach’s alphas of 0.70–0.93; Berg, Peterson, Frazier, & Crow, 2012). The EDE-Q also documents frequencies of bingeing and vomiting episodes, as well as weight and height. In our sample, the Cronbach's alpha for the EDE-Q total score was 0.92.

2.5 | Data analyses

Analyses were performed to compare treatment completers, participants who dropped out from treatment, and participants who were lost to follow-up on various descriptive and clinical variables. Across groups, continuous variables were compared using one-way analyses of variance whereas categorical variables were compared using chi-squares. Only participants with AN were included in analyses comparing mean body mass index, and only participants who binged and purged weekly at baseline were included in analyses on binge-eating and vomiting frequencies.

To examine effects of motivation on outcome, we opted to focus on two overarching indicators of treatment outcome, namely EDE-Q total score and treatment dropout. Both of these variables, we reasoned, could be meaningfully applied trans-diagnostically across individuals with different eating-disorder diagnoses.

For the EDE-Q total score, rather than performing separate regression analyses to assess the predictive effects of autonomous and controlled motivations on the outcome at Time 2 and at Time 3, we opted for an integrated approach involving application of growth curve modeling (see Raudenbush, 2001) to the repeated measures data, which were nested within participants. First, we ran a growth curve model to estimate the intraclass correlation coefficient (i.e., the proportion of the total variance attributable to between-participant variability). Then, we ran a model that used dummy variables to contrast repeated measures collected at Time 2 and then at Time 3. The latter model allowed us to examine changes in EDE-Q total score as a function of treatment milestones. Next, we ran two separate models, one testing the effect of autonomous motivation on EDE-Q total at Time 1, Time 2, and Time 3; the other testing effects of controlled motivation at the same time points. Autonomous and controlled motivation scores were both centered on the grand mean. Then, in two separate models, we adjusted for being in day treatment (vs. low-intensity outpatient), diagnosis (BN or OSFED vs. AN), and having participated in one or more than one treatment prior to the current treatment (vs. being in treatment for the first time). Finally, we examined whether or not there were interaction effects implicating autonomous and controlled motivation. To test this possibility, we ran a model which included the main effects of treatment milestones, autonomous motivation, and controlled motivation along with the interaction of autonomous motivation and controlled motivation.

To examine the effects of autonomous and controlled motivations on the likelihood of dropping out of treatment, we performed a two-step logistic regression analysis, as follows: In two separate logistic regression analyses, we first entered the centered value of autonomous motivation or controlled motivation as a predictor of likelihood of dropping out of treatment. In the second step, we adjusted the
model for the same variables used in the growth curve models for predicting trajectories of EDE-Q total (i.e., day treatment, diagnosis, and having participated in one or more than one treatment prior to the current treatment). To further probe any statistically significant effects of motivation on the likelihood of dropping out, we recoded values of motivation into quintiles and reran the logistic regression analyses to identify which levels of motivation might be associated with likelihood of dropping out.

3 | RESULTS

3.1 | Sample characteristics

Table 1 shows baseline characteristics comparing treatment completers, participants who dropped out from treatment, and participants who were lost to follow-up. One-way analyses of variance and chi-squared tests revealed that treatment completers, treatment dropouts, and participants lost to follow-up had similar baseline profiles, except for the following: The mean EDE-Q score was significantly lower in the group of participants who were lost to follow-up compared to the groups of participants who either dropped out or completed treatment ($F[2, 767] = 8.28, p < .01, \eta^2 = 0.01$, Tukey HSD $p < .05$ and $p < .01$, respectively); Mean autonomous motivation score and number of previous treatment rounds were significantly lower in the dropout group compared to the completer and lost to follow-up groups ($F[2, 767] = 4.27, p < .05, \eta^2 = 0.01$, Tukey HSD both $p < .04$; $F[2, 766] = 5.84, p = .003, \eta^2 = 0.02$, Tukey HSD $p < .02$ and $p = .008$, respectively).

3.2 | Motivation as a predictor of treatment outcomes

Our first analysis of EDE-Q total scores showed that the intraclass correlation coefficient $r$ was 0.556, indicating that a little over half of the total variance (including within- and between-participant variance) was associated with between-participant variance. This value was statistically significant ($\chi^2 [769] = 2550.5, p < .001$). The model examining the fixed effects of treatment milestones showed that, compared to Time 1 scores, EDE-Q total scores were significantly lower both at Time 2 (coeff. = −0.78, $p < .001$) and at Time 3 (coeff. = −0.77, $p < .001$). However, a simple contrast showed that values of EDE-Q were not significantly different between Time 2 and Time 3 ($\chi^2 [1] = 0.02, p > .50$).

More interestingly, when adding autonomous motivation as a predictor of EDE-Q total scores at the various time points, we observed that at Time 1, participants with higher autonomous motivation had lower EDE-Q total scores in comparison to participants with lower autonomous motivation scores (coeff. = −0.15, $p < .004$). Participants with higher autonomous motivation scores also showed significantly greater decreases in EDE-Q total scores at Time 2 (coeff. = −0.15, $p < .005$) in comparison to participants with lower scores. Autonomous motivation was not, however, associated with differential changes at Time 3 (coeff. = −0.08, $p > .50$). Adjusting for different covariates (i.e., day treatment, diagnosis, and having participated in one or more than one treatment prior to the current treatment) did not change the patterns observed in the unadjusted models. The final unadjusted and adjusted models appear in Table 2.

A somewhat different pattern emerged for controlled motivation. Here, although participants with higher controlled motivation scores had higher EDE-Q scores at Time 1 (coeff. = 0.20, $p < .001$), controlled motivation did not significantly moderate changes either at Time 2 or at Time 3. Adjusting for covariates did not change the pattern of findings. Results of unadjusted and adjusted models are presented in Table 2.

Examination of the correlation between scores on autonomous and controlled motivation showed that these two variables were uncorrelated ($r = 0.045, p > .50$). The preceding allowed for examination of interaction effects. Analyses including both autonomous motivation and controlled motivation as predictors for EDE-Q total scores at Time 2 and at Time 3 showed the same main effects as observed in the separate analyses (results not shown) but none of the interaction effects reached statistical significance. Adjusting for covariates did not change the findings.

| TABLE 1 Baseline characteristics comparing treatment completers, treatment dropouts, and participants who were lost to follow-up |
|--------------------|--------|--------|--------|
| **Mean (SD)**      | Compliers ($n = 580$) | Dropouts ($n = 133$) | Lost to follow-up ($n = 57$) |
| Age (years)        | 28.74 (9.97) | 26.68 (8.29) | 27.32 (9.48) |
| Female             | 565 (97.4%) | 129 (97.0%) | 55 (96.5%) |
| Low-intensity treatment          | 413 (71.2%) | 98 (73.7%) | 37 (64.9%) |
| Diagnosis          |                    |                    |                    |
| Anorexia nervosa   | 164 (28.3%) | 41 (30.8%) | 11 (19.3%) |
| Bulimia nervosa    | 209 (36.0%) | 54 (40.6%) | 19 (33.3%) |
| OSFED              | 207 (35.7%) | 38 (28.6%) | 27 (47.5%) |
| Symptom severity   |                    |                    |                    |
| BMI for anorexia-nervosa participants | 15.82 (1.21; $n = 164$) | 15.75 (1.52; $n = 41$) | 15.95 (1.23; $n = 11$) |
| EDE-Q total        | 3.83 (1.38) | 3.80 (1.53) | 3.12 (1.54)** |
| Binging episodes per 4 weeks$^a$ | 27.63 (26.67; $n = 275$) | 24.91 (25.74; $n = 72$) | 22.55 (24.09; $n = 20$) |
| Days with vomiting per 4 weeks$^b$ | 19.54 (8.70; $n = 281$) | 20.00 (8.50; $n = 58$) | 17.43 (8.35; $n = 21$) |
| Previous treatment courses at the clinic | 0.69 (1.38) | 0.33 (0.70)** | 0.95 (1.39; $n = 56$)$^c$ |
| Motivation         |                    |                    |                    |
| Autonomous motivation | 5.90 (1.04) | 5.64 (1.09)$^a$ | 6.05 (.82) |
| Controlled motivation | 4.13 (1.46) | 4.16 (1.52) | 4.08 (1.19) |

Note. OSFED = Other Specified Feeding or Eating Disorder; BMI = Body Mass Index; EDE-Q = Eating Disorder Examination Questionnaire.

$^a$n is lower because only participants who vomit at least once per week were included.

$^b$n is lower because only participants who binge at least once per week were included.

$^c$n is lower due to an isolated missing value.

Asterisks represent significant differences, $^*p < .05$, $^{**}p < .01$, $^{***}p < .001$. 
Examination of the association of motivation on likelihood of dropping out revealed a pattern of findings consistent with those obtained on the EDE-Q total scores. Logistic regression analyses showed that higher autonomous motivation was associated with lower likelihood of dropping out of treatment (OR = 0.81; 95% CI: 0.69, 0.96). Furthermore, adjusting for covariates did not attenuate associations. In contrast, controlled motivation was not associated with likelihood of dropping out (OR = 1.02; 95% CI: 0.89, 1.16). Again, adjusting for covariates did not change the findings. Probing further the association of autonomous motivation with likelihood of dropping out by recoding values of autonomous motivation into quintiles showed that those individuals in the lowest quintile of autonomous motivation had a significantly greater likelihood of dropping out of treatment (OR = 1.97; 95% CI: 1.28, 3.03). The preceding association was not significantly changed by adjusting for covariates (OR = 2.03; 95% CI: 1.30, 3.15).

### 4 | DISCUSSION

The goal of this study was to assess the extent to which indices of autonomous and controlled motivations serve as predictors of response to outpatient treatment in adults with an eating disorder. In keeping with initial hypotheses, our findings suggest that outcome progressed more favorably in eating-disordered individuals who displayed higher autonomous motivation at the start of treatment. In contrast, controlled motivation was not associated with outcome.

A more fine-grained analysis of results suggests differential influences of autonomous motivation on overall eating-disorder symptomatology at different points in time. For instance, we observed that higher pre-treatment autonomous motivation was associated with milder pre-treatment eating-disorder symptoms and significantly predicted greater decrease in eating-disorder symptoms at Time 2. Results showing autonomous motivation to predict change in symptoms across trajectories of treatment corroborate previous effects observed (Carter & Kelly, 2015; Mansour et al., 2012; Thaler et al., 2016). However, investigations of effects of autonomous motivation on eating-disorder symptoms at longer term essentially revealed an absence of association. One possible explanation for this result may be that maintenance of high autonomous motivation throughout and after treatment (possibly in relation to feeling autonomously supported), rather than the baseline measure, has an impact on response at longer term. Alternatively, tendencies towards regression to the mean might eventually cancel any prognostic effects of the motivation variable.

Analyses of the effects of controlled motivation upon symptom evolution revealed a different pattern of results. Controlled motivation was associated with higher pre-treatment eating-disorder severity but did not predict trajectories of symptoms. Although an association between controlled motivation and poorer outcome would be consistent with predictions based on Self-Determination Theory...
(Ryan & Deci, 2008), no such association has been found in our study
nor in the available eating-disorder literature. One explanation for the
lack of effect of controlled motivation on trajectories of eating-
disorder symptoms may be that more constraining interventions (such
as hospitalization or family-based therapy) have been shown to be
effective (Collin, Power, Karatzias, Grierson, & Yellowlees, 2010; Le
Grange, Lock, Agras, Bryson, & Jo, 2015; Lock et al., 2010; Madden
et al., 2015), and may over-ride effects of controlled motivation.

Similar findings to those observed on eating-disorder symptom
indices emerged in analyses examining the effects of motivation on
the likelihood of dropping out of treatment. Again, higher pre-
treatment autonomous motivation was associated with better out-
come, that is, lower likelihood of dropout, whereas controlled motiva-
tion was not. Additional tests revealed that participants with the
lowest autonomous motivation were at greatest risk of premature
treatment termination. Here, our findings are in line with those of
Vandereycken and Vansteenkiste (2009), who found that an auton-
omy supportive approach to eating-disorder treatment resulted in
reduced dropout rates during the first weeks of hospitalization.

Our study had several limitations. First, our results were obtained
using participant-completed questionnaires, meaning that our findings
are subject to limitations inherent in all self-report studies. Second,
study participants were drawn from a convenience sample of patients
who were compliant with research and should not, therefore, be
assumed to be representative of all people seeking eating-disorder
treatment. Finally, our study had a high attrition rate, our Time 3
group was small, and data were potentially not missing at random, providing
a limited representation of the population of interest.

As has previous research, our results suggest that autonomous
motivation is a predictor of good outcome in an adult outpatient pop-
ulation treated for an eating disorder. In contrast, our findings suggest
that controlled motivation does not influence outcome. While it is
interesting, and of potential clinical importance, that autonomously
motivated people do better in eating-disorder focused treatments, the
real "proof of the pudding" is whether we can develop clinical tech-
niques that help people become more autonomously motivated. In this
regard, a small literature has accumulated to support the notion that
certain values are of central importance: Among these are values asso-
ciated with offering help in a manner that is autonomy supportivethat
is, offered in a manner that is collaborative, informative, noncoer-
cive, and conducive to personal engagement (See Steiger et al., 2017
and van der Kaap-Deeder et al., 2014 for empirical support). Future
research should continue to explore the setting conditions that
enhance autonomous motivation in the treatment of eating disorders
and of other disorders that often entice therapists to act coercively.

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