

Do people ruminate because they haven't digested their goals? The relations of rumination and reflection to goal internalization and ambivalence

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Abstract In three studies it was investigated whether rumination was related to less internalized self-regulation and goals and whether reflection was related to more internalized self-regulation and goals. In all studies students completed questionnaires measuring rumination, reflection, and internalization of self-regulation and goals. In Study 1, rumination was related to less internalized self-regulation, whereas reflection was related to more internalized self-regulation. In Study 2, rumination was related to less internalized self-regulation and goals as well as to more avoidance- and extrinsic content of goals. Reflection was related to more internalized self-regulation and goals as well as to less avoidance content of goals. In Study 3, goal-specific rumination was related to less internalized goals and goal-specific reflection was related to more internalized goals. Collectively, the studies suggest that internalization of self-regulation and goals is critical for distinguishing between unconstructive and constructive self-focused repetitive thoughts.

Keywords Rumination · Reflection · Internalization · Goals · Self-regulation

Introduction

Self-focused repetitive thoughts seem to be a double-edged sword, especially when encountering negative events and experiencing negative emotions. On the one hand, self-

focused repetitive thoughts in the form of rumination has been found to be associated with a range of negative outcomes (for reviews see Brosschot et al. 2006; Thomsen 2006; Watkins 2008). On the other hand, self-focused repetitive thoughts seem to be a prerequisite for accurate self-knowledge (Trapnell and Campbell 1999) and have been connected to emotional processing, stress-related growth and the finding of meaning (Janoff-Bulman 2006; Kross et al. 2005; Tedeschi and Calhoun 2004). Because self-focused repetitive thoughts are linked to self-regulation and goal pursuit (Martin and Tesser 1989, 1996; Watkins 2008), whether such thoughts are unconstructive or constructive may depend on characteristics of self-regulation and goals. Here we examine whether internalization of self-regulation and goals may play a role. Less internalization of goals and self-regulation is associated with lack of mental integration that may cause goal conflict and ambivalence leading to unconstructive self-focused repetitive thoughts. More internalization may, on the other hand, be associated with higher mental integration and thus less goal conflict and ambivalence supporting more constructive self-focused repetitive thoughts.

In three studies we investigated whether internalization of self-regulation and goals distinguish between unconstructive and constructive self-focused repetitive thoughts in terms of rumination and reflection. We predicted that rumination would be related to less internalized self-regulation and goals and that reflection would be related to more internalized self-regulation and goals.

In the following we first define and operationalize unconstructive and constructive forms of self-focused repetitive thoughts. Second, we discuss how goal-based theories about rumination may be integrated with theories about internalization of self-regulation and how this integration may contribute to distinguishing between rumination and reflection.

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Unconstructive and constructive self-focused repetitive thoughts

In the present context, repetitive thoughts are used as a neutral super-ordinate category subsuming rumination, reflection, and a variety of other thought patterns (Watkins 2008). We use Trapnell and Campbell's (1999) conceptualizations and operationalizations of rumination and reflection. Thus, rumination (or "neurotic self-consciousness") "may chiefly involve compulsive attending to perceived threats, losses, and injustices to the self" (p. 290), and reflection (or "epistemic self-consciousness") "may chiefly involve playful exploring of novel, unique, or alternative self-perceptions" (p. 290). Although reflection is defined in a more positive tone, it may also be directed towards negative affect and events. While rumination is conceptually related to a broad range of negative thinking patterns associated with clinical disorders, such as intrusive thoughts and worry (e.g., Borkovec et al. 1998; Clark and Purdon 1995), reflection captures cognitive processes thought to be involved in accurate self-perception (Trapnell and Campbell 1999).

We will focus on rumination as an unconstructive form and reflection as a constructive form of self-focused repetitive thoughts. There are three reasons for this focus: (1) both rumination and reflection appear to be stable tendencies (Treyner et al. 2003) enabling the individual differences approach taken in Studies 1 and 2 in the present paper, (2) rumination and reflection have been found to be relatively independent of each other (Nolen-Hoeksema et al. 2008; Trapnell and Campbell 1999), and (3) both rumination and reflection capture self-focused repetitive thoughts that are clearly expected to be either constructive or unconstructive (Trapnell and Campbell 1999; Watkins 2008). Hence, operationalizing unconstructive and constructive self-focused repetitive thoughts as rumination and reflection is a meaningful way to investigate possible relationships with internalization of self-regulation and goals.

Repetitive thoughts and internalization of goals and self-regulation

In one influential theory, self-focused repetitive thoughts have been linked to self-regulation through the concept of goals (Martin and Tesser 1996). In this theory goals are assumed to be hierarchically organized with more abstract and long term goals at the top level (e.g., "obtain a degree in psychology") and more concrete subgoals at the lower levels (e.g., "pass exams"). Lower level subgoals are linked to higher order goals and function as pathways to goals higher in the hierarchy (Martin and Tesser 1996). Repetitive thoughts are suggested to occur when the individual does not progress towards her/his goals as planned

(e.g., when failing exams) (Martin and Tesser 1996). This theory does not distinguish between unconstructive and constructive self-focused repetitive thoughts and does not address individual differences in whether such thought become unconstructive or constructive. However, Watkins (2008) has suggested that theories adopting a goal hierarchy understanding of self-regulation (e.g. Carver and Scheier 2000b; Martin and Tesser 1996) may be elaborated to account for individual differences in unconstructive and constructive repetitive thoughts by focusing on characteristics of the underlying goals. Here, we suggest that degree of internalization of self-regulation and goals may be an important characteristic that could help explain whether repetitive thoughts will be unconstructive or constructive.

According to Deci and Ryan (2000) "*internalization* is an active, natural process in which individuals attempt to transform socially sanctioned mores or requests into personally endorsed values and self-regulations" (p. 235–236, original italics). There are different degrees of internalization (e.g. Deci and Ryan 2000; Emmons 1999; Kuhl and Kazén 1994). More internalized goals are pursued because the individual identifies with the goal, which is integrated with other goals and beliefs, values and self-schemata (Deci and Ryan 2000; Emmons 1999). When an individual has not fully internalized the goal, the goal may be pursued to achieve praise or avoid guilt (Deci and Ryan 2000; Emmons 1999). Because less internalized goals have not been "mentally digested" to the same degree as more internalized goals, they may be less integrated with the individual's other goals, beliefs, values and self-schemata (Deci and Ryan 2000).

Due to lower mental integration, less internalized goals may be in conflict with other goals and be accompanied by ambivalence, which have been shown to be associated with rumination (Emmons and King 1988). These considerations lead to the following predictions: (1) less internalized goals will be associated with more rumination and (2) the relationship between rumination and less internalized goals will be partly explained by ambivalence and goal conflict.

More internalized goals would, on the other hand, be associated with less conflict and ambivalence, resulting in less rumination. The high internalization and integration of goals would also seem to promote reflection instead of rumination, because such goals support exploratory cognitive activities by allowing access to a wide range of interrelated material. These considerations lead to the following predictions: (1) more internalized goals will be associated with more reflection and (2) the relationship between reflection and more internalized goals will be partly explained by less conflict and ambivalence.

In Study 1 we tested the two main hypotheses: That rumination is related to less internalized self-regulation and that reflection is related to more internalized

self-regulation. In order to examine the overall credibility of our ideas at the level of individual differences, we used general measures of internalized self-regulation, rumination and reflection.

In Study 2 we attempted to replicate the main hypotheses using three different assessments of internalization: (1) a general measure of internalized self-regulation, (2) internalization of important goals and (3) observer-rated content of goals associated with internalization. In addition, the secondary hypotheses were tested: That ambivalence and conflict partly explain the associations between rumination, reflection and internalization.

In Study 3 we examined if internalization of specific goals is associated with ruminating or reflecting about that specific goal. In addition, it was also investigated whether ambivalence explained the associations between goal-related rumination, goal-related reflection and internalization of goals.

Study 1

In this study, we examined the idea that overall individual differences in internalization of self-regulation would be related to rumination and reflection. In order to measure individual differences in internalization of self-regulation, we used the general causality orientations scale, which measures three types of causality orientations: Autonomous, Controlled and Impersonal (Deci and Ryan 1985). Individuals with a high level of autonomous orientation experience a high degree of self-determination and choice and they organize their life according to personal goals and interests (Deci and Ryan 1985). In addition, "...with a high level of autonomy orientation, people are more often intrinsically motivated" (p. 112) and autonomy orientation have also been found to be related to more integrated functioning (e.g. Hodgins and Knee 2002; Koestner et al. 1992; Sheldon and Kasser 1995). Based on this, autonomy orientation can be assumed to be associated with a high degree of internalized self-regulation and in the present study we expected autonomy to be associated with a higher degree of reflection and a lower degree of rumination. Individuals with a high level of controlled orientation on the other hand, organize their behaviour according to external rewards, social norms and expectations. These individuals may have some degree of internalization of goals, but the goals are pursued for extrinsic reasons, like rewards or other people's expectations, and the individual experiences goal pursuit as pressured by these rewards or expectations. Finally, individuals with a high level of impersonal orientation experience a lack of control over events in their life and feel that their lives are controlled by external forces. Thus, the impersonal orientation is associated with the least internalized regulation. In

the present study, we expected impersonal to be associated with a higher degree of rumination and a lower degree of reflection.

Method

Participants and recruitment

The participants were 176 psychology students, 143 women, 29 men and 4 blanks (age $M = 25.37$, $SD = 5.5$), who were recruited in two waves.

Materials

Rumination and reflection was measured using the Rumination-Reflection Questionnaire (RRQ; Trapnell and Campbell 1999). The RRQ consists of two subscales, each with 12 items, measuring rumination and reflection respectively. Items are rated on 5-point scales with higher scores indicating higher degrees of rumination and reflection. Examples of items are: "I love exploring my "inner" self" (reflection) and "I tend to "ruminate" or dwell over things that happen to me for a really long time afterwards" (rumination). The scale was translated into Danish and showed good internal reliability (Cronbach's alphas = 0.90 and 0.89 for the rumination and reflection subscales respectively).

In order to measure internalization of self-regulation, the General Causality Orientation Scale (GCOS, Deci and Ryan 1985) was used. The GCOS consists of three subscales: Autonomous, controlled and impersonal. The version containing 17 vignettes describing work-related and social situations was used in the present study. Each vignette is rated on three 7-point scales expressing different responses to the situation (i.e. autonomous, controlled and impersonal). Example of a vignette and the associated items are "You have been offered a new position in a company where you have worked for some time. The first question that is likely to come to mind is:" (1) "What if I can't live up to the new responsibility?" (impersonal), (2) "Will I make more at this position?" (controlled) and (3) "I wonder if the new work will be interesting?" (autonomous). Responses to the 17 vignettes were then totalled for each subscale. The GCOS was translated into Danish and showed acceptable internal reliability (Cronbach's alpha = 0.78, 0.76 and 0.81 for the autonomous, controlled and impersonal subscales respectively). The subscales have been confirmed by factor-analyses (Olesen et al. 2010).

Results and discussion

In order to test whether rumination would be associated with less internalized self-regulation and whether reflection

Table 1 Study 1 correlations between rumination, reflection and internalization of self-regulation

	Rumination	Reflection
Autonomous	−0.12	0.33*
Controlled	0.01	0.06
Impersonal	0.45*	−0.19*

* $p < 0.05$

would be associated with more internalized self-regulation, a series of Pearson correlations were calculated. Generally the results confirmed predictions (see Table 1) and are in accordance with a previous study (Luyckx et al. 2007). Highly ruminating individuals showed less internalized self-regulation, as evidenced by a positive correlation with impersonal self-regulation. In a mirror image of these results, highly reflecting individuals showed more internalized self-regulation as evidenced by a positive correlation with autonomous self-regulation and a negative correlation with impersonal self-regulation. The correlations between rumination and autonomous and between rumination and impersonal were significantly different from the correlations between reflection and the same variables (Hotelling's t s 4.92 and 7.63, $ps < 0.01$, respectively). In addition, rumination and reflection were also weakly positively associated with each other ($r(170) = 0.18$, $p < 0.05$), perhaps because of a shared variance in self-focused repetitive thoughts.

Generally, the results suggest that internalization of self-regulation may distinguish between rumination and reflection.

Study 2

In Study 1 we found support for the idea that rumination is associated with less internalized self-regulation and that reflection is associated with more internalized self-regulation. However, self-regulation was assessed at a global level rather than in relation to concrete goals. In Study 2, we therefore investigated whether internalization of concrete goals would distinguish between rumination and reflection. We used Emmon's (1999) construct of personal strivings to assess the participants' goals. Personal strivings have been conceptualized as relatively enduring and overarching goals, capturing what people typically try to accomplish (Emmons 1986), thus capturing relatively stable individual tendencies in goal pursuit. We asked participants to rate the degree of internalization of five important personal strivings. We predicted that rumination would be associated with less internalized goals and that reflection would be associated with more internalized goals.

Study 2 was also designed to address two secondary hypotheses: (1) That the associations between rumination and less internalized goals would be partly explained by more goal ambivalence and conflict and (2) that the associations between reflection and more internalized goals would be partly explained by less goal ambivalence and conflict.

Less internalized goals are less integrated with other goals and knowledge of the self. Thus, less internalized goals would be associated with more ambivalence and more conflict, which would then lead to more rumination. The association between conflict, ambivalence and rumination, has been confirmed in one study, although internalization was not included in this study (Emmons and King 1988). On the other hand, more internalized goals are integrated with other goals and thus should be characterized by less conflict and ambivalence, which would facilitate goal pursuit and perhaps promote reflection.

Rumination, reflection and content of goals

A third aim of Study 2 was to address the relationships between rumination, reflection and goal *content* associated with internalization. According to self-determination theory, some goals are inherently more congruent with the individual's basic needs ("intrinsic" goals, like "be a caring mother"). On the other hand some goals may be less congruent with basic needs ("extrinsic" goals, like "make others admire me") and the pursuit of such goals may, if prioritized too highly, detract from the satisfaction of basic needs (Deci and Ryan 2000; Kasser and Ryan 1993; Niemiec et al. 2009; Sheldon and Kasser 1998; Sheldon et al. 2004; Schmuck et al. 2000). Extrinsic goals have been found to be less internalized than intrinsic goals (Sheldon and Kasser 1998; Sheldon et al. 2004).

Similarly, it has also been suggested that avoidance goals, e.g. trying to avoid a negative outcome, are less internalized than approach goals, e.g. trying to attain a positive outcome (Carver and Scheier 2000a), perhaps because avoidance goals are typically developed under conditions of contingent punishment (Deci and Ryan 2000). The approach-avoidance dimension is not equivalent to the intrinsic-extrinsic dimension or the degree of internalization dimension. However, studies have found support for the notion that avoidance goals are less internalized (Elliot and Sheldon 1998; Emmons and Kaiser 1996).

Thus, less internalized goals may be characterized by extrinsic and avoidance content (e.g. Deci and Ryan 2000; Kasser and Ryan 1993) and thus having such goal contents may also be associated with increased rumination. Similarly, intrinsic and approach goals are more internalized and would thus promote reflection. Investigations of extrinsic-intrinsic goal contents have previously used self-reporting of goal content (Kasser and Ryan 1993;

Schmuck et al. 2000; Sheldon and Kasser 1995, 1998; Sheldon et al. 2004). However, in the present study we attempted to measure content in a more objective way, by having two independent coders rate the extrinsic and avoidance content of important goals that were generated by participants.

Based on the above and on results from Study 1 we predicted that rumination would be associated with less internalized goals and that this association would be partly explained by more ambivalence and conflict. In addition, we predicted that reflection would be associated with more internalized goals and that this association would be partly explained by less ambivalence and conflict. To extend our measures beyond self-report data we included observer ratings of goal content related to internalization, namely extrinsic and avoidance content. Because extrinsic and avoidance goals are less internalized the predictions for these goal contents follow the prediction for less internalized goals, i.e. that these goal contents would be related to more rumination.

Method

Participants and recruitment

The participants were 677 freshmen from a number of different study areas enrolling at the University of Aarhus, summer 2007. There were 472 women, 204 men and 1 where gender information was not available (age $M = 21.92$, $SD = 4.86$). They were recruited through the Registry at the University of Aarhus, which sends emails to all freshmen as a part of the enrolment procedure. Participants were provided with links to electronic versions of the questionnaires. Originally the invitation to the study was sent to 3738 students. Of these, 677 students responded to all the questionnaires relevant to the present study, resulting in a response rate of 18%. Responders did not differ from non-responders on age ($t(3725) = 0.68$, $p = 0.50$), but differed from non-responders on gender, where women were overrepresented among responders ($X^2(1) = 53.71$, $p < 0.05$).

Materials and procedure

As in Study 1, rumination and reflection was measured using the Rumination-Reflection Questionnaire (RRQ; Trapnell and Campbell 1999). Again the RRQ showed good internal reliability (Cronbach's alpha = 0.90 and 0.93 for the rumination and reflection subscales respectively). Internalized self-regulation was measured using the General Causality Orientation Scale (GCOS, Deci and Ryan 1985) and the subscales also showed acceptable internal reliability in this study (Cronbach's alpha = 0.78,

0.70 and 0.82 for the autonomous, controlled and impersonal subscales respectively).

A shortened version of The Personal Striving Assessment Packet (PSAP, Emmons 1999) was used to measure content and characteristics of goals. The instructions were based on Emmons (1999). Participants received a general description of personal strivings and were then asked to write down their ten most typical personal strivings. They then selected the five most important personal strivings.

In order to measure the degree of internalization, the personal strivings were rated on four 7-point scales measuring internalization (based on Sheldon and Kasser 1995). The first item concerned external motivation and focused on rewards, praise or criticism; the second item concerned introjected motivation and focused on shame, guilt, anxiety and 'oughts'; the third item concerned identified motivation and focused on importance and rightness of the striving and the fourth item concerned intrinsic motivation and focused on interest, enjoyment and fun. Each motivation was totalled across the five strivings to achieve a more general measure of internalization of goals and these totals were used in the following analysis. The internal reliability for the four scales was acceptable considering the few items for each subscale (0.63, 0.71, 0.68 and 0.67 for the external, introjected, identified and intrinsic subscales respectively).

In order to measure goal ambivalence, participants were asked to rate their personal strivings on the relevant Striving Assessment Scale (SAS) (based on Emmons 1999), namely "Ambivalence" answered on a 5-point scale with 1 = not at all and 5 = to a very high degree. The wording of the question is as follows: "Sometimes, even when we are successful in reaching a goal, we are unhappy. Even success sometimes has its cost. For example, if you are "Trying to become more intimate with someone," and you succeed, you might also feel concern about being more tied down, having more responsibility, and being unable to date others, etc., despite also being pleased with the outcome. Choose a number from the scale below that indicates how ambivalent or unhappy you would be about succeeding at the striving". The responses were summed across the five strivings to yield a total ambivalence score. Although the internal reliability was below standard values for acceptable internal reliability (Cronbach's alpha 0.46) this total was used in the following analysis.

Lastly, the participants completed conflict ratings for their five most important strivings using the Striving Instrumentality Matrix (SIM). The instructions were based on Emmons (1999). Participants were asked to consider how each striving may influence each of her/his other four strivings and asked to rate this on 20 5-point scales, anchored with 1 = "it would help striving x to a high degree" and 5 = "it would oppose striving x to a high

degree". A total conflict score was obtained by summing across the four questions for each of the five strivings.

All questionnaires were completed through electronic links emailed to the participants. Because of software limitations, each electronic questionnaire had to be completed within one hour. Hence, the questionnaires relevant to the present study were distributed into three packages: The GCOS was completed in the first package (see also Olesen et al. 2010), the RRQ was completed in the second package and the shortened version of PSAP was completed in the third package. Because the identification of typical strivings usually requires some time for consideration, the participants were given the initial part of the instruction for the PSAP at the end of the second package and asked to spend some time thinking about their typical strivings before opening and answering package 3.

Coding of goal content

The content of the goals were coded by two independent raters on two dimensions: Intrinsic-extrinsic and approach-avoidance. Descriptions of these dimensions and rules for their coding was developed by the first and second author through a combination of the content coding described in Emmons (1999), previous literature on extrinsic and intrinsic goals and the actual content of the goals described in the present sample (email first author for detailed descriptions).

The content of the goal was rated as extrinsic if it fitted into one of the following categories: "Physical appearance", "self-presentation/status/image", "conformity" and "other extrinsic goals" (e.g., financial success). Although achieving financial success has often been nominated a prominent extrinsic goal (e.g. Kasser and Ryan 1993) it was not included as a separate category in the present analysis because very few of the participants' goals concerned financial issues. A total extrinsic score was achieved by summing the number of extrinsic goals across the five goals.

A goal was rated as an avoidance goal if the content clearly indicated that the participant was trying to avoid, minimize or prevent certain outcomes, for example: "avoid conflicts" and "try to be less shy". A total avoidance score was achieved by summing the number of avoidance goals across the five goals.

The two raters were trained by the first and second author using pilot data from 13 students. Each rater then independently coded the content of each of the five goals from the total sample. The two raters agreed on 94% of extrinsic-intrinsic ratings and on 98% of approach-avoidance ratings with Cohen's kappa of 0.70 and 0.88 respectively. Disagreements were resolved by discussion.

Results and discussion

Rumination, reflection and internalization of self-regulation and goals

Below we describe the results of testing whether rumination is associated with less internalized self-regulation and whether reflection is associated with more internalized self-regulation using the three different assessments of internalization: (1) global internalization of self-regulation (self-rating), (2) internalization of goals (self-rating) and (3) extrinsic and avoidance content of goals (observer rating).

First, concerning the analysis with the internalization of self-regulation, a series of Pearson correlations were calculated. Generally, the results confirmed the findings from Study 1 (see Table 2). The correlations between rumination and autonomous and between rumination and impersonal were significantly different from the correlations between reflection and the same variables. Thus, highly ruminating individuals showed less internalized self-regulation and highly reflecting individuals showed more internalized self-regulation.

Second, concerning the internalization of goals, the correlations between rumination, reflection and internalization of goals displayed a pattern very similar to internalization of self-regulation (see Table 2). The correlations between rumination and the measures of internalized goals were significantly different from the correlations between reflection and the same variables. Thus, highly ruminating individuals had more external and introjected goals and less identified and intrinsic goals. Highly reflecting individuals had more identified and intrinsic goals.

Third, concerning the content of goals, correlations showed that highly ruminating individuals were more

Table 2 Study 2 correlations between rumination, reflection, internalization of self-regulation, internalization of goals, goal content, ambivalence and conflict (differences between correlations are tested with Hotelling's t)

	Rumination	Reflection	Hotelling's t
Autonomous	-0.08	0.30*	9.67*
Controlled	0.00	-0.03	0.72
Impersonal	0.41*	-0.13*	14.60*
External	0.21*	-0.02	4.75*
Introjected	0.30*	-0.02	6.78*
Identified	-0.15*	0.09*	4.93*
Intrinsic	-0.15*	0.12*	5.57*
Extrinsic content	0.12*	-0.01	2.64*
Avoidance content	0.08*	-0.09*	3.46*
Ambivalence	0.27*	-0.04	6.51*
Conflict	0.00	-0.11*	2.23*

* $p < 0.05$

likely to have goals with extrinsic content and with avoidance content. Highly reflecting individuals, on the other hand, were less likely to have goals with avoidance content, but were not less likely to have goals with extrinsic content. The correlations between rumination and the content of goals were significantly different from the correlations between reflection and the same variables (see Table 2).

Thus, for all three assessments of internalization, rumination was associated with less internalization of self-regulation and goals. Reflection was also associated with more internalized self-regulation and goals, although fewer of the internalization measures reached significance. The convergence of results using three different assessments of internalization (global internalization of self-regulation, internalization of goals and content of goals), adds strength to the conclusion that degree of internalization may distinguish between individuals prone to rumination or reflection.

Rumination, reflection, internalization, ambivalence and conflict

Our secondary hypotheses were that associations between rumination, reflection and internalization of goals would be partly explained by ambivalence and goal conflict. In order to test this, two step-wise multiple regressions were conducted. Rumination and reflection were entered as the dependent variables. Gender was controlled for in the first step of the rumination regression, because women scored higher on rumination than men ($t(674) = 4.22, p < 0.05$). In addition, rumination was controlled for in the regression predicting reflection and reflection was controlled for in the regression predicting rumination. This was done because rumination and reflection correlated weakly ($r(675) = 0.15, p < 0.05$), perhaps because of a shared variance in self-focused repetitive thoughts. Controlling for the other variable thus ensures that internalization is related to the unique aspects of rumination and reflection respectively. At the second step, the measures of internalization that were significantly correlated with rumination/reflection were entered, and at the third step ambivalence (for rumination) or conflict (for reflection) were entered. If there is a statistical mediation effect, the measures of internalization should be significantly associated with rumination/reflection at the second step. At the third step ambivalence or conflict should be significantly associated with rumination/reflection and the associations between the measures of internalization and rumination/reflection should be significantly reduced (Baron and Kenny 1986).

As can be seen from Table 3, only introjected and identified motivation was significantly associated with rumination. Thus, content associated with internalization

Table 3 Study 2 regression with rumination, internalization of goals, goal content and ambivalence

	Second step	Third step
External	0.06	0.03
Introjected	0.27*	0.24*
Identified	−0.14*	−0.12*
Intrinsic	−0.06	−0.05
Extrinsic content	0.02	0.02
Avoidance content	0.02	0.02
Ambivalence	–	0.14*

* $p < 0.05$

did not contribute independently to explaining rumination, perhaps because the large majority of participants had very few avoidance and extrinsic goal contents (more than 600 participants had 0 or 1 avoidance or extrinsic goal content) restricting variation in these variables. Contrary to expectations, ambivalence did not reduce the association between introjected, identified and rumination, but rather explained additional variance in rumination ($F(9, 666) = 17.30, p < 0.05, adj. R^2 = 0.18$). The analysis with reflection as the dependent variable showed that only intrinsic motivation was significantly associated with reflection ($\beta = 0.10, p < 0.05$). At the third step conflict was significant ($\beta = -0.08, p < 0.05$), but did not reduce the association between intrinsic and reflection ($\beta = 0.09, p < 0.05$). Thus, conflict did not mediate the relationship between intrinsic motivation and reflection, but rather explained additional variance in reflection. The low degree of variance accounted for in the regression ($F(6, 669) = 6.50, p < 0.05, adj. R^2 = 0.05$ at the third step), suggests that the internalization measures and goal contents included in the present study were poorer at predicting reflection compared to rumination.

Study 3

In both Studies 1 and 2 we found support for the idea that rumination was associated with less internalized self-regulations and goals, and that reflection, although to a lesser extent, was associated with more internalized self-regulation and goals. However, in both studies rumination and reflection were measured as general tendencies, i.e. rumination and reflection were not assessed in relation to specific more or less internalized goals. The hypotheses would be more strongly supported if rumination and reflection were assessed specifically with relation to the more or less internalized goals. In Study 3 we asked participants to list four goals, rate these goals on internalization and rate rumination and reflection specifically related to each goal.

Methods

Participants

The participants were 83 psychology students, 76 women, with a mean age of 23.90 ($SD = 5.32$). Participants were recruited through courses at the department and participation was voluntary.

Materials

In the first section of the questionnaire, participants were given a general description of strivings and asked to generate their ten most typical strivings (following Emmons 1999). They were then asked to select four strivings that best described what they were typically trying to do. Following this, they were asked to rate each striving on a number of variables. First, they rated each striving on ambivalence (and a number of other characteristics not relevant to the present study). A total ambivalence score was derived by adding the questions across the four strivings (Cronbach's $\alpha = 0.43$). They then rated each striving on the four questions measuring internalization (based on Sheldon and Kasser 1995). Each internalization question was totaled across the four strivings to achieve a more general measure of internalization of goals. Cronbach's α for these totals were in the lower range (0.37–0.55). Finally, participants rated each striving with respect to how much they ruminated and reflected over experiences and activities related to each striving. Five questions measuring rumination and five questions measuring reflection were developed for the present study (see Table 4). In the development of these questions, we borrowed heavily from the RRQ (Trapnell and Campbell 1999), while rewording items to capture rumination and reflection in relation to specific strivings. In addition, we selected and worded items to be as emotionally neutral as possible. The scales showed high internal reliability for both rumination and reflection across all four goals

(Cronbach's α ranging from 0.86 to 0.91). A total rumination and reflection score was created by adding the five rumination and five reflection items for each of the four goals and a grand total for rumination and reflection was created by summing rumination and reflection across the four goals.

Results and discussion

In order to test whether rumination was associated with less internalized goals and whether reflection was associated with more internalized goals we conducted a series of correlations. The results generally supported the hypotheses (see Table 5) and were consistent with results from Studies 1 and 2 (although the correlations were only significantly different between rumination and reflection for intrinsic). Like in the previous studies, rumination and reflection also tended to be weakly positively related ($r(76) = 0.21, p = 0.07$).

In order to take full advantage of the within-person nature of the data and to overcome potential problems with the low internal reliabilities of the internalization measures, a multilevel linear analysis was conducted (using maximum likelihood estimation). In this analysis, each participant was considered to nest four goals, which was each associated with one total for rumination (based on the five items) and four measures of internalization (external, introjected, identified and intrinsic). Thus, participant was entered as the nesting variable and the four measures of internalization were entered as predictors of rumination or reflection, which were the dependent variables.

In order to calculate a baseline model which could serve as comparison for the model containing the four measures of internalization, we calculated a model containing only the intercept for the participant variable, i.e. whether the participants varied in level of rumination. The intercept for participant was significant ($b = 3.48, p < 0.05$) with a -2 log likelihood of 1979.83 and a BIC of 1997.20. We then entered the four measures of internalization as fixed effects.

Table 4 Questions measuring goal-related rumination (1–5) and reflection (6–10)

1. Sometimes it's hard for me to shut off thoughts about activities and experiences related to striving x
2. I tend to dwell over activities and experiences related to striving x for a really long time afterwards
3. I spend much time on rehashing in my mind activities and experiences related to striving x
4. My attention is often focused on activities and experiences related to striving x that I wish I'd stop thinking about
5. My thoughts keep going back to activities and experiences related to striving x, long after they are over
6. My attitudes and feeling about activities and experiences related to striving x fascinate me
7. I like to meditate and reflect over activities and experiences related to striving x
8. I like analyzing the causes of activities and experiences related to striving x
9. I like thinking about the nature and meaning of activities and experiences related to striving x
10. I like thinking about activities and experiences related to striving x in a broader perspective

Table 5 Study 3 correlations between rumination, reflection, and internalization of goals (differences between correlations are tested with Hotelling’s *t*)

	Rumination	Reflection	Hotelling’s <i>t</i>
External	0.23*	0.01	1.58
Introjected	0.32*	0.16	1.18
Identified	0.08	0.26*	1.30
Intrinsic	−0.20	0.42*	5.04*
Ambivalence	0.36*	−0.05	3.10*

* $p < 0.05$

The -2 log likelihood was 1946.88 and the BIC was 1987.41. The change in model fit was significant (X^2 change (1979.83–1946.88) = 32.95, df change (2–6) = 4, $p < 0.05$), indicating that adding the four measures of internalization increased the fit of the model. The intercept for participants was still significant ($b = 2.53$, $p < 0.05$). More interestingly, the results showed that a higher degree of rumination was related to a higher degree of introjected and a lower degree of intrinsic (see Table 6, results for random effects of the four internalization measures were all non significant, data not shown). In order to examine if ambivalence explained the relationship between internalization and rumination, we ran a second multilevel linear analysis adding ambivalence as a predictor variable of rumination. In this new model, the -2 log likelihood was 1919.85 and the BIC was 1966.14. The change in model fit was significant (X^2 change (1946.88–1919.85) = 27.03, df change (6–7) = 1, $p < 0.05$), indicating that adding ambivalence increased the fit of the model. The intercept for participants became non significant ($b = 2.15$, $p = 0.07$). More interestingly, the results showed that higher degree of rumination was associated with more ambivalence. Although the parameter estimates for introjected and intrinsic were somewhat reduced in this model, introjected remained significant and intrinsic was close to significance ($p = 0.06$), suggesting that ambivalence in itself explain variance in rumination independent of internalization.

Table 6 Study 3 Multilevel linear models with rumination, internalization of goals and ambivalence

	First model		Second model	
	<i>b</i> (SE)	<i>F</i> (1, 298–325)	<i>b</i> (SE)	<i>F</i> (1, 315–323)
External	0.38 (0.26)	2.10	0.17 (0.26)	0.42
Introjected	0.61* (0.21)	8.96*	0.49* (0.20)	5.93*
Identified	0.45 (0.25)	3.37	0.75* (0.25)	9.19*
Intrinsic	−0.63* (0.23)	7.67*	−0.42 (0.23)	3.46
Ambivalence	–		1.09* (0.24)	20.97*

* $p < 0.05$

We then ran a similar analysis with reflection as the dependent variable. In order to calculate a baseline model which could serve as comparison for the model containing the four measures of internalization, we calculated a model containing only the intercept for the participant variable, i.e. whether the participants varied in level of reflection. The intercept for participant was significant ($b = 10.19$, $p < 0.05$) with a -2 log likelihood of 1932.73 and a BIC of 1950.08. We then entered the four measures of internalization as fixed effects. The -2 log likelihood was 1884.11 and the BIC was 1924.62. The change in model fit was significant (X^2 change (1932.73–1884.11) = 51.38, df change (2–6) = 4, $p < 0.05$), indicating that adding the four measures of internalization increased the fit of the model. The intercept for participants was still significant ($b = 9.18$, $p < 0.05$). More interestingly, the results showed that a higher degree of reflection was related to a higher degree of identified and intrinsic and a lower degree of introjected (see Table 7, results for random effects of the four internalization measure were all non significant, data not shown). In order to examine if ambivalence explained the relationship between internalization and reflection, we ran a second multilevel linear analysis adding ambivalence as a predictor variable of reflection. However, ambivalence did not reach significance in this model.

Generally both the correlations and the multilevel linear models showed that rumination was related to less internalized goals, whereas reflection was related to more internalized goals. In addition, rumination, but not reflection, was related to feeling ambivalent about the goal. The results are thus consistent with the results from Studies 1 and 2, but extend these findings by showing that the associations hold for rumination and reflection measured with respect to specific goals.

General discussion

In three studies we found support for the hypothesis that less internalized self-regulation and goals is related to rumination using both global and more specific assessments of internalization and rumination as well as both self-rated and observer-rated assessments (Studies 1, 2 and 3). The studies, however, suggested that ambivalence and goal conflict did not explain the relationship between internalization and rumination. Thus, internalization and ambivalence contributed independently to explaining rumination (Studies 2 and 3).

The results for reflection also generally supported our predictions although to a lesser extent than the results for rumination. Reflection was associated with more internalized self-regulation, with more internalized goals and more approach goals (Studies 1, 2 and 3). At the same time

Table 7 Study 3 multilevel linear models with reflection, internalization of goals and ambivalence

	First model		Second model	
	<i>b</i> (SE)	<i>F</i> (1, 298–325)	<i>b</i> (SE)	<i>F</i> (1, 315–323)
External	0.24 (0.23)	1.10	0.23 (0.24)	1.01
Introjected	−0.45* (0.19)	5.92*	−0.45* (0.19)	5.65*
Identified	0.45* (0.22)	4.12*	0.44 (0.23)	3.62
Intrinsic	1.05* (0.21)	26.53*	1.05* (0.21)	25.10*
Ambivalence	–		−0.02 (0.22)	0.02

* $p < 0.05$

reflection was associated with having goals with less conflict (Study 2) although this did not explain the association between internalization and reflection. However, the results concerning reflection were generally weaker (especially in Study 2). This may be because individuals with fully internalized goals tend to focus more on the flow of experience or engage in mindfulness states rather than reflecting (Brown and Ryan 2003). This is consistent with the idea that negative affect and events invite self-focus to a higher degree than positive affect and events (Watkins 2008).

The results testify to the utility of the concept of internalization of goals and self-regulation in explaining whether repetitive thoughts are constructive or unconstructive both at the between-individual (Studies 1 and 2) and within-individual (Study 3) level. These results are consistent with the central idea in self-determination theory, i.e. that internalization of self-regulation has important implications for efficiency of self-regulation and well-being (Deci and Ryan 2000). Several studies have found that rumination is related to poorer emotional and physical well-being (see Brosschot et al. 2006; Thomsen 2006; Watkins 2008 for reviews). There are also indications that rumination is related to cognitive deficits in terms of reduced cognitive flexibility (Davis and Nolen-Hoeksema 2000), over-general memory (e.g. Watkins and Teasdale 2001; Watkins et al. 2000) and poorer problem solving (Lyubomirsky et al. 1999; Lyubomirsky and Nolen-Hoeksema 1995). Thus, poor internalization of goals and self-regulation may cause increased rumination, which may then interfere with goal-progress through its negative impact on cognitive resources, over time leading to lower well-being.

With respect to reflection, the results are also consistent with self-determination theory since a high degree of internalization has been shown to be associated with accurate self-knowledge in the form of congruence between behavior and self-reported aspects of personality (Koestner et al. 1992). Reflection may be an important process in facilitating such accurate self-knowledge (e.g.

Trapnell and Campbell 1999). Research on relationships between reflection and well-being is more sparse and somewhat mixed, but contrary to studies on emotional well-being and rumination, there appears to be no clear relationship between reflection and emotional well-being (see Nolen-Hoeksema et al. 2008 for an overview). Thus, although a high degree of internalized self-regulation and goals is associated with reflection, this may not necessarily lead to higher emotional well-being, although reflection may have other potential benefits. Future research clearly needs to examine the consequences of reflection using prospective designs.

Alternative interpretations

The ideas presented in the introduction focus on how internalization of self-regulation and goals may cause individuals to either ruminate or reflect. However, Studies 1, 2 and 3 were cross-sectional and as such the studies do not test causal relationships between rumination, reflection and internalization of self-regulation and goals. It is also possible that rumination leads to poorer internalization of goals, perhaps because rumination depletes cognitive and emotional resources that are needed for integrating newly acquired goals with other mental structures. This would be in accordance with Kuhl's (2000) theory of Personality Systems Interactions (PSI). In this theory it is suggested that state-oriented individuals, who are likely to ruminate, are unable to down-regulate negative affect. The negative affect blocks access to the implicit self, which is a holistic representation of the self, encompassing the individual's needs, wishes and goals. Because access to the implicit self is impeded by negative affect, state-oriented individuals will be less likely to fully internalize and integrate goals and thus pursue less internalized goals. Possibly, the relationship between rumination and less internalized goals is dynamic, with both influencing the other over time.

Likewise for reflection, it is possible that the tendency to reflect makes the individual more likely to integrate newly acquired goals with other mental structures. This is because

reflection is a more open and explorative thought process (Trapnell and Campbell 1999), which would enable the individual to gain access to a wide range of relevant material, thus creating links between the newly acquired goals and other goals, values, beliefs and self-schemata. In PSI theory, highly reflecting individuals may be those who are able to down-regulate negative affect (see Kross et al. 2005 for relevant findings) and gain relatively easy access to the implicit self. This would increase the likelihood that highly reflecting individuals will pursue goals that are in closer accordance with their basic needs, values and skills, over time leading to less negative affect. Interestingly, mindfulness, a concept distinct from but weakly positively related to reflection, has been shown to be associated with higher correspondence between implicit and explicit measures of affect and with autonomous self-regulation (Brown and Ryan 2003).

Perspectives

The studies presented here attempt to integrate goal based theories with theories emphasizing internalization (Deci and Ryan 2000; Kuhl 1992; Martin and Tesser 1996). Although the results were generally consistent with our primary hypotheses, the secondary hypotheses focusing on *how* internalization may influence rumination and reflection were not supported. As the analyses concerning ambivalence and goal conflict in Studies 2 and 3 showed, the association between less internalization and rumination was not explained by these variables. Also, reflection was only weakly related to goal conflict and this variable did not explain the association between reflection and internalization. Thus, future studies could address other characteristics of more or less internalized goals leading to either rumination or reflection.

Watkins (2008) has suggested that ill-defined high level goals, which are characterized by few or unrealistic links to lower level subgoals are central for understanding why repetitive thoughts become unconstructive. The paucity of realistic subgoals cause a lack of flexible movement between higher order and lower order subgoals, which maintains repetitive thoughts in an unconstructive format (Watkins 2008). Based on the present findings, we suggest that ill-defined goals, are ill-defined because they are not internalized, i.e. they have not been integrated with the individual's other goals, values and knowledge. Because less internalized goals are less integrated with the individual's knowledge and other goals, the individual may be less able to develop a variety of subgoals, which are congruent with self-knowledge and other goals. The lack of a variety of realistic subgoals would prohibit flexible and context-sensitive goal pursuit, causing problems in goal pursuit and leading to rumination. Hence, future studies

could investigate if less internalized goals are characterized by (1) fewer links to lower level subgoals, (2) less realistic links to subgoals and/or (3) links to subgoals in conflict with other subgoals, and if these characteristics of less internalized goals predict (a) poorer progress (e.g. Sheldon and Elliot 1998) and (b) difficulties in goal disengagement (Kuhl 1992).

Limitations

The associations in the present studies were weak to moderate. In Studies 1 and 2 rumination, reflection and internalization of self-regulation and goals were measured as general tendencies. Study 3, however, was a replication of the central hypotheses using goal specific measures and the results tended to be stronger. Thus, it is possible that a more goal specific approach would yield stronger results. Future studies may be designed to measure internalization, rumination and reflection in response to specific goals perhaps using a within-subjects experience-sampling design.

The present studies were cross-sectional and given that the relationships between internalization, rumination and reflection are probably dynamic, prospective studies using multiple follow-up measures are clearly needed.

In the present studies constructive and unconstructive self-focused repetitive thoughts were operationalized as reflection and rumination. However, a wide range of self-focused repetitive thoughts have been identified (e.g. Watkins 2008) and future studies may include measures of such constructs.

Conclusion

In conclusion, less internalization of goals and self-regulation was associated with rumination and more internalization of self-regulation and goals was associated with reflection. Thus, internalization is central for distinguishing between rumination and reflection. The current studies thus testify to the advantages of integrating goal based theories of self-focused repetitive thoughts with theories emphasizing internalization processes in self-regulation.

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