



Examining the Structure of Work Motivation: The Curious Case of Introjected Regulation

ORIGINAL ARTICLE

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ABSTRACT

The Multidimensional Work Motivation Scale (MWMS) is a widely used measure of qualities of motivational experience in working contexts, but its item composition and number of factors have been called into question. In the present study, the MWMS was examined regarding its items, factor structure, and criterion validity in two Finnish working samples using exploratory structural equation modelling. The previously observed problematic nature of the approach-oriented introjection items was replicated. The approach-oriented introjection items created for the study exhibited similar problems. Removing approach-oriented items may improve the measurement of the introjected regulation factor; however, it also narrows the conceptual coverage of the measure and potentially biases associations with covariates. Among the factor structures, a six-factor model with amotivation, external material regulation, external social regulation, introjected regulation, identified regulation, and intrinsic motivation provided the best fit to self-determination theory's motivation continuum regardless of item composition. Additionally, a seven-factor model with approach-oriented and avoidance-oriented introjected regulation dimensions as separate factors was promising, although hindered by challenges with the approach-oriented items. In conclusion, introjected regulation should be measured with both positive and negative aspects, and new items or modelling approaches may be needed to fully capture the multidimensionality of introjected regulation. The study's strengths include its two separate samples and the use of advanced statistical methods. Limitations include reliance on self-reported data and the need for further validation in diverse samples.

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INTRODUCTION

Motivation is a set of internal and external factors that energises an individual's behaviour and determines its intensity, duration and direction (Pinder, 2008). Self-determination theory (SDT; Ryan & Deci, 2017) and related research have demonstrated the value of examining qualitatively different dimensions of motivation (Meyer et al., 2022) in addition to its strength. Prior research has demonstrated that different dimensions of motivation have distinct effects on work behaviours and outcomes (e.g., Van den Broeck et al., 2021). This underscores the benefits of conceptualising and operationalising motivation as distinct yet partially interrelated dimensions within SDT's theoretical approach.

There is ongoing discussion of how best to conceptualise and model these different dimensions (Bureau et al., 2023; Howard, Gagne, & Bureau, 2017; Howard et al., 2018, 2020; Trépanier et al., 2023). Operationalisations have ranged from a single index of relative autonomy to multidimensional bifactor models attempting to capture both the degree of overall self-determination and the specific dimensions (see Howard et al., 2020, for a review). Some authors have suggested shortening the measures (Trépanier et al., 2023), and some have advocated for more refined measuring of the multidimensional constructs (Bieg et al., 2024).

The present study contributes to the discussion in three major ways: (1) We replicate and expand a recent psychometric study (Trépanier et al., 2023) by examining the most appropriate factor structure of the Multidimensional Work Motivation Scale (MWMS) (Gagné et al., 2015) in the Finnish working context; (2) we focus especially on the introjected regulatory style, which has been suggested to be a multidimensional phenomenon (Bieg et al., 2024; More & Phillips, 2021), including devising new items to measure the regulatory style; (3) finally, we examine whether the criterion validity of the measure varies depending on the item composition with which introjected regulation is operationalised.

SELF-DETERMINATION THEORY AND REGULATORY STYLES

SDT (Ryan & Deci, 2017) aims to be a comprehensive theory of wellbeing, motivation, and development. At its heart are two theoretical postulates. First, motivation is conceptualised through qualitatively distinct types of motivation. Second, human motivation and wellbeing are postulated to be built on three universal basic psychological needs: autonomy, competence, and relatedness (Vansteenkiste, Soenens, & Ryan, 2023). The need for autonomy concerns the experience of acting volitionally and with self-endorsement and ownership of one's actions. The need for competence constitutes the need for experiences of showing and developing one's capacities and acting effectively. The need for relatedness

is about warm reciprocal relationships with individuals and groups. According to SDT, experiences of basic psychological need satisfaction are key determinants of motivational quality.

Furthermore, SDT states that the three qualities of motivation (amotivation, extrinsic motivation, and intrinsic motivation) can be described by six regulatory styles, which simultaneously vary by the experienced reasons for one's behaviour and by their degree of self-determination (Pelletier & Rocchi, 2023; Ryan & Deci, 2017). The least self-determined type of motivation is *amotivation*, characterised by a lack of motivation, which is accompanied by non-intentional regulation, in which a person does not consider their needs, interests, or intentions to bear significance on behaviour (Ryan & Deci, 2017). Four of the regulatory styles relate to extrinsic motivation. *External regulation* is based on rewards and punishments extrinsic to the behaviour. Although the degree of self-determination is also low in this type of regulation, external regulation differs from amotivation by representing a motivated state.

A somewhat more self-determined motivational quality is *introjected regulation*. One of the main goals of the present study is to examine its multidimensionality. According to Deci & Ryan (1985), it is based on a process through which external contingencies of behaviour are internalised largely in their original form, and individuals themselves begin to apply approval or disapproval to themselves. Because this internalisation lacks full assimilation, the regulation of actions is only in part harmonious with one's inner experience and includes feelings of internal demand and control (Ryan & Deci, 2017). One important aspect of introjected regulation is ego-involvement, a threat to self-esteem that pressures a person to perform in certain ways (Ryan, Koestner, & Deci, 1991). These pressures can be described in affective terms, such as satisfaction, pride, guilt, and shame (Ryan & Deci, 2017).

The nature and measurement of introjected regulation have recently been discussed in several publications. Trépanier et al. (2023) suggest removing two so-called approach-oriented items from one of the more widely used work motivation measures, the MWMS (Gagné et al., 2015). The items depict the more positive side of introjected regulation by referring to pride and abilities. The remaining items are avoidance-oriented, and their contents concern feeling bad and ashamed as pressures regulating behaviour. Overall, introjected regulation has been operationalised in various ways in different contexts; some measures focus only on negative aspects, some only on positive, and some cover approval from others and some from self (see Bieg et al., 2024).

In contrast, *identified regulation* represents a more harmonious motivational experience, as it is based on values and goals consciously deemed important. Identified regulation represents a more autonomous

and persistent type of extrinsic motivation than the three preceding regulatory styles. Next, *integrated regulation* refers to a quality of experience in which a synthesis among different identifications has been achieved and conflicting cravings have been mindfully acknowledged and accepted (Deci & Ryan, 2000; Ryan & Deci, 2000). However, behaviour is still regulated by extrinsic instrumentality instead of by interest in the activity (Gagné & Deci, 2005). Finally, *intrinsic motivation* is based on interest and the satisfaction of participating in the activity itself and is the most self-determined quality of motivation (Ryan & Deci, 2017).

In the working context, each regulatory style has been observed to have independent associations with criterion variables, with more self-determined styles having stronger associations with wellbeing compared with less self-determined styles (Van den Broeck et al., 2021). Introjected regulation has been associated with both positive and negative phenomena. Satisfaction of basic psychological needs, another important component of SDT, is associated with a more self-determined quality of work motivation (Olafsen, Deci, & Halvari, 2018; Van den Broeck et al., 2016). Finally, in SDT, self-determined experiences and behaviours are assumed to be reflected in subjective vitality (Frederick & Ryan, 2023) and performance and behaviour (Van den Broeck et al., 2021). The present study includes the two energy-related criterion variables of work engagement and exhaustion in addition to the satisfaction of the three basic psychological needs as well as two work performance measures. Past research has shown that SDT's regulatory styles are related to work engagement and performance in a relatively consistent manner (Van den Broeck et al., 2021).

Most importantly for the present study, the associations of regulatory styles with the relevant criterion variables naturally depend on their operationalisations. This is most obvious regarding introjected regulation, the definition of which includes conflicting internalised pressures (Ryan & Deci, 2017) and whose measurement has varyingly emphasised different aspects of the regulatory style (Bieg et al., 2024). If the content of an introjected regulation scale changes, it could alter associations with covariates and the meaning of the construct itself. Therefore, we examine whether the absence of specific items or adding new items affects the associations of the regulatory styles and their assumed antecedents and outcomes.

In addition to introjected regulation and its operationalisation, prior research has debated how best to model the motivational continuum proposed by SDT. Recent studies have applied exploratory structural equation modelling (ESEM) and bifactor ESEM (B-ESEM) in SDT research and related fields (Howard, Gagne, & Bureau, 2017; Howard et al., 2018; Trépanier et al., 2023). Using ESEM, Trépanier et al. (2023) concluded that a four-factor model fit best after removing three

items. However, their conclusions remain uncertain due to substantial convergence problems.

The present study seeks to replicate and extend this work in a Finnish working context by examining the factor structure and criterion validity of MWMS. Determining whether MWMS and the SDT continuum more broadly should be modelled as suggested by Trépanier et al. (2023) remains a key empirical and theoretical issue.

RESEARCH QUESTIONS

- (1) What is the most appropriate factor structure for the MWMS? We test the alternative structures specified by Trépanier et al. (2023) to determine the best candidates. Additionally, we test a model that separates introjected regulation into approach-oriented and avoidance-oriented factors.
- (2) Is it possible to formulate additional valid items to measure the approach-oriented and avoidance-oriented dimensions of introjected regulation? We devise two new approach-oriented items and two new avoidance-oriented items for the introjected regulation scale and test factor models in which they are included.
- (3) How does item composition affect the associations between introjected regulation and other regulatory styles, relevant antecedents (basic psychological need satisfaction and control by money), and outcomes (work engagement, exhaustion, work performance and work quality)? We examine the correlations of the focal variables with MWMS item compositions based on the results of the previous research questions.

MATERIALS AND METHODS

PARTICIPANTS AND PROCEDURE

Two samples of working adults were used. Sample 1 consisted of 269 participants responding to a Finnish-language online survey shared mainly through the social media platform LinkedIn. The participants' mean age was 43 years (standard deviation 10.21). Of the respondents, 85.5% were female, and 11.9% were male. The rest (2.5%) did not disclose their gender or identified as nonbinary. Among the sample, 10.0% had an upper secondary education degree, 22.3% had a bachelor's degree, and 67.7% had a master's degree or higher. Most respondents had a permanent contract (74.0%). The rest either had fixed-term contracts (17.1%), described themselves as entrepreneurs or freelancers (7.7%), or did not respond or were unable to say (2.3%).

In Sample 2, the respondents consisted of a random sample of scholars working at eight Finnish universities. The survey was sent to 4,134 randomly chosen individuals, yielding 621 respondents. The participants'

mean age was 44 years (standard deviation 12.15). Of the respondents, 54.1% were female, 42% were male, and the rest (3.9%) either chose not to disclose their gender or identified as nonbinary. All respondents had completed at least a master's degree, with 60.7% holding a doctoral degree. Most respondents had a fixed-term contract (56.5%) or a permanent contract (35.6%). The rest (7.9%) indicated that they were either grant researchers or did not have an official employment contract at the time of the survey.

MEASURES

Regulatory styles were assessed with the MWMS (Gagné et al., 2015). It includes a stem about reasons to put effort into one's work and items for amotivation, external material regulation, external social regulation, introjected regulation, identified regulation, and intrinsic motivation. The MWMS omits integrated regulation, which is difficult to empirically distinguish from adjacent regulatory styles (Howard, Gagne, & Bureau, 2017). The items are responded to on a scale from 1 ('Not at all') to 7 ('Completely'). (For item content, see Trépanier et al., 2023).

The MWMS was translated into Finnish from the English version by two professional translators working independently. A group of researchers then selected the most suitable translations for the instructions and the items, and the questionnaire was translated back to English by a third professional translator. Some expressions were edited to better convey the intended meaning. The Finnish translation used in the present study is a different translation from the Finnish translation used in some previous studies (e.g., Lahnalampi, Roos, & Suominen, 2020). Both translations are approved by Marylène Gagné, the original primary author of the MWMS.

Four new items created by the authors of the present study were included in the data collection. Two items were intended to measure approach-oriented introjected regulation (intro5: 'Because in that way I can "prove myself to others"'; intro6: 'Because it is the only way I can appreciate myself'), and two items were intended to measure avoidance-oriented introjected regulation (intro7: 'Because otherwise I would feel guilty'; intro8: 'Because otherwise I would consider myself as a disappointment').

Basic psychological need satisfaction was measured using the satisfaction items of the Basic Psychological Need Satisfaction and Frustration Scale adapted for the work context (Chen et al., 2015; Karkkola & Martela, 2024; Van der Kaap-Deeder et al., 2020). The items consist of 12 statements describing satisfaction (e.g., 'At work, I feel a sense of choice and freedom in the things I undertake') regarding the three needs (autonomy, competence, and relatedness). The items were responded to on a scale from 1 ('Strongly disagree') to 7 ('Strongly agree').

Work engagement was assessed with the Utrecht Work Engagement Scale (Schaufeli et al., 2002; Seppälä et al., 2009). Participants responded to nine items describing work engagement (e.g., 'At my work, I feel bursting with energy') on a scale from 1 ('Never') to 7 ('Every day'). Exhaustion was measured with the exhaustion scale of the Burnout Assessment Tool (de Beer et al., 2020), in which eight items (e.g., 'Everything I do at work requires a great deal of effort') are responded to on a scale from 1 ('Never') to 5 ('Always'). Work engagement and exhaustion were measured only in Sample 1.

Self-reported work performance was measured using a two-item scale developed by Meyer, Allen, & Smith (1993). A sample item is 'How would you rate your job performance over the past year relative to others who have a similar amount of experience?' The items were scored on a 7-point scale from 1 ('Clearly below average') to 7 ('Well above average'). Self-reported work quality was assessed using a five-item measure developed by Dysvik and Kuvaas (2011) (e.g., 'The quality of my work is usually high'). The items were scored on a 7-point scale from 1 ('Strongly disagree') to 7 ('Strongly agree'). The controlling effect of monetary rewards was measured using an adapted version of Fisher's (1978) Control by Pay scale, consisting of four items (e.g., 'The main thing that determines how hard I work is the money I am making'). The items were scored on a 7-point scale from 1 ('Strongly disagree') to 7 ('Strongly agree'). Self-reported work performance, work quality, and the controlling effect of monetary reward were measured only in Sample 2.

STATISTICAL ANALYSES

Demographic information and careful responding were examined using IBM SPSS Statistics (version 28). Structural equation modelling was conducted with Mplus (version 8.9 in Sample 1 and version 8.11 in Sample 2) using the maximum likelihood estimator with robust standard errors. In structural equation models, both comparative fit index (CFI) and Tucker–Lewis index (TLI) were considered to indicate acceptable (≥ 0.90), good (≥ 0.95), or excellent fit (≥ 0.99) and both root mean square error of approximation (RMSEA) and standardised root mean square residual (SRMR) to indicate acceptable (≤ 0.08), good (≤ 0.05), or excellent fit (≤ 0.01) (for the criteria, see Little, 2013).

For research questions 1 and 2, ESEM was used to specify and examine the factor structures. For research question 2, SDT's motivational continuum was also modelled using bifactor ESEM S–1 modelling. This approach allowed us to investigate the relative standing of introjected regulation items on the SDT continuum. The B-ESEM S–1 model consisted of a general factor (G), which is defined by the common variance of all the items, and five specific factors (S) (amotivation, external material regulation, external social regulation, introjected

regulation, and identified regulation). Because the model lacked an S-factor for intrinsic motivation, the G-factor was anchored in intrinsic motivation. All factors were specified to be uncorrelated. For further discussion of B-ESEM S-1 models in the context of SDT's motivational continuum, see Bureau et al. (2023). For all examined factor structures, see Table 1.

For research question 3, latent factors of criterion variables (without rotation and not allowing for cross-loadings) were added in the appropriate MWMS measurement models to examine the associations.

RESULTS

FACTOR STRUCTURE OF MWMS

Research question 1 concerned the most appropriate factor structure for MWMS. First, we tested Models 1 through 5, which are the same models Trépanier et al. (2023) examined. In Sample 1, Models 1 through 3 had acceptable or good fit ($CFI \geq 0.961$, $TLI \geq 0.923$, $SRMR \leq 0.022$, $RMSEA \leq .057$). Regarding Model 1, all indicators had statistically significant loadings ($p < 0.01$) on their theoretically assigned primary factors. The two approach-oriented introjected regulation items had weaker loadings ($\lambda = 0.39\text{--}0.43$, $p < 0.01$) on their factor compared to the two avoidance-oriented items ($\lambda = 0.71\text{--}0.76$, $p < 0.01$). Cross-loadings were relatively small. The only exception was the approach-oriented intro1 item loading on the external social regulation factor ($\lambda = 0.30$, $p < 0.01$). In Models 2 and 3, approach-oriented introjected regulation items had smaller loadings on the primary factor compared to avoidance-oriented items. Additionally, cross-loadings in these models were substantial, especially with external social regulation items on the introjected regulation factor in Model 2 and identified regulation items on the introjected regulation factor in Model 3.

Similarly, in Sample 2, Models 1 through 3 had acceptable or good fit ($CFI \geq 0.961$, $TLI \geq 0.923$, $SRMR \leq 0.022$, $RMSEA \leq .057$). In Model 1, except for the two approach-oriented introjected regulation items (intro1 and intro2), all items had a statistically significant loading on their theoretically assigned factors. The two approach-oriented introjected regulation items had weak, nonsignificant positive loadings on their factor ($\lambda = 0.19\text{--}0.21$) while showing substantial cross-loadings on external social regulation ($\lambda = 0.33\text{--}0.37$, $p < 0.01$) and identified regulation ($\lambda = 0.35\text{--}0.50$, $p < 0.01$). Additionally, there were some other cross-loadings with nonadjacent factors. Models 2 and 3 had more statistically significant cross-loadings compared with Model 1. These results suggest that despite some weaknesses, the six-factor solution of Model 1 is better for modelling MWMS. For further information on factor loadings in both samples, see Table 2. For full information on fit statistics, see Appendix, Tables 1–2.

Next, we tested Model 6 (a seven-factor model), which separates introjected regulation into approach-oriented and avoidance-oriented factors. In Sample 1, the residual covariance matrix was not positively definite due to the negative residual variance of exs3. After constraining the residual variance of this item to 0.01 fit was good to excellent ($CFI = 0.998$, $TLI = 0.995$, $SRMR = 0.012$, $RMSEA = 0.016$). The approach-oriented introjected regulation items had weak loadings on their primary factor ($\lambda = 0.07\text{--}0.26$, $p > 0.01$) and had a substantial cross-loading on the avoidance-oriented introjected regulatory factor ($\lambda = 0.31\text{--}0.34$, $p < 0.01$). The avoidance-oriented introjected regulation items had strong loadings on their primary factor ($\lambda = 0.62\text{--}0.72$, $p < 0.01$), with no substantial cross-loadings. In Sample 2, fit was good to excellent ($CFI = 0.994$, $TLI = 0.982$, $SRMR = 0.010$, $RMSEA = 0.027$). The approach-oriented introjection regulation items had moderate loadings on their factor

ABBREVIATION	FACTORS IN THE MODEL
Model 1	amotivation, external material, external social, introjected, identified, intrinsic motivation
Model 2	amotivation, external (material and social regulations combined), introjected, identified, intrinsic motivation
Model 3	amotivation, external material, external social, introjected, autonomous motivation (identified regulation and intrinsic motivation combined)
Model 4	amotivation, external (material and social regulations combined), introjected, autonomous motivation (identified regulation and intrinsic motivation combined)
Model 5	amotivation, controlled motivation (material, social and introjected regulation combined), autonomous motivation (identified regulation and intrinsic motivation combined)
Model 6	amotivation, external material, external social, introjected-avoidance, introjected-approach, identified, intrinsic motivation
Model 7	G-factor anchored in intrinsic motivation, S-factors for amotivation, external material regulation, external social regulation, introjected regulation, and identified regulation

Table 1 The MWMS factor models tested in the study.

All factors are correlated in Models 1–6. All factors are uncorrelated in Model 7. MWMS item compositions may vary between analyses (original, reduced, and expanded item composition).

ITEM	INTRINSIC MOTIVATION (λ)	IDENTIFIED REGULATION (λ)	INTROJECTED REGULATION (λ)	EXTERNAL SOCIAL REGULATION (λ)	EXTERNAL MATERIAL REGULATION (λ)	AMOTIVATION (λ)
Amotivation						
amo1	-0.01/-0.01	0.20/0.08	-0.15/-0.03	0.12/-0.02	-0.05/0.03	0.92/0.77
amo2	-0.04/-0.04	-0.15/0.02	-0.03/0.08	0.00/-0.06	-0.06/-0.02	0.78/0.79
amo3	0.10/0.07	-0.12/-0.02	0.12/-0.04	-0.13/0.06	0.02/-0.02	0.86/0.88
External material						
exm1	-0.09/-0.05	0.04/-0.01	0.21/0.10	-0.20/-0.06	0.75/0.75	0.00/0.02
exm2	-0.01/-0.06	0.08/0.06	-0.06/-0.10	0.09/0.12	0.47/0.51	0.09/0.06
exm3	0.10/-0.02	-0.07/0.11	-0.20/-0.15	0.18/0.07	0.75/0.80	-0.07/-0.07
External social						
exs1	-0.04/0.04	0.05/-0.07	0.00/0.07	0.83/0.69	0.10/0.11	-0.06/-0.03
exs2	-0.01/0.07	-0.14/-0.30	0.25/0.37	0.44/0.37	0.02/0.18	0.13/0.13
exs3	0.04/0.15	-0.07/-0.16	0.23/0.21	0.65/0.65	0.02/0.09	0.01/-0.01
Introjected						
intro1	-0.03/-0.07	0.12/0.35	0.39/0.21	0.30/0.37	0.00/0.04	0.07/0.05
intro2	0.11/-0.02	0.20/0.50	0.43/0.19	0.13/0.33	-0.03/-0.06	-0.17/-0.10
intro3	0.00/-0.17	0.01/0.18	0.76/0.66	0.10/0.11	-0.03/-0.04	-0.08/-0.06
intro4	-0.09/-0.07	-0.02/-0.05	0.71/0.74	0.04/0.14	0.09/0.05	0.12/0.05
Identified						
id1	0.22/0.30	0.53/0.50	0.05/0.18	-0.03/-0.17	-0.03/0.08	-0.09/-0.05
id2	0.03/0.29	0.85/0.54	0.09/0.19	-0.06/-0.15	0.03/0.03	-0.07/-0.14
id3	0.08/0.31	0.77/0.44	0.02/0.22	-0.04/-0.10	-0.00/0.03	0.01/-0.14
Intrinsic motivation						
im1	0.93/0.73	0.06/0.10	0.04/0.00	-0.03/0.03	-0.00/-0.05	-0.07/-0.15
im2	0.72/0.79	0.19/0.16	0.02/-0.09	-0.01/0.06	0.03/-0.06	-0.01/-0.04
im3	0.86/0.81	0.07/0.13	-0.09/-0.14	0.04/0.10	-0.02/-0.03	0.07/0.01

Table 2 Standardised factor loadings (λ) of ESEM-estimated MWMS model with six behavioural regulations (Model 1, original item composition).

Sample 1/Sample 2.

($\lambda = 0.48\text{--}0.55$, $p < 0.01$), and intro2 had a substantial loading on the identified regulation factor ($\lambda = 0.34$, $p < 0.01$). The avoidance-oriented introjected regulation items had strong loadings on their factor ($\lambda = 0.64\text{--}0.82$, $p < 0.05$), with no substantial cross-loadings. Despite the very good fit statistics, the loadings of approach-oriented items tapping introjected regulation proved problematic, especially in Sample 1. See Table 3 for information on factor loadings of introjected regulation items.

Finally, following Trépanier et al. (2023) and consistent with our results concerning the relatively weak loadings of the approach-oriented introjected regulation items on their primary factor, we omitted the approach-oriented items and tested Model 1 with this reduced item composition. In Sample 2, we constrained the residual variance of intro4 to 0.01 to

resolve an initial failure to converge. After this, fit was good to excellent in both Sample 1 (CFI = 0.990, TLI = 0.972, SRMR = 0.013, RMSEA = 0.038) and Sample 2 (CFI = 0.992, TLI = 0.979, SRMR = 0.012, RMSEA = 0.030). In Sample 1, the avoidance-oriented introjected regulatory items had relatively strong loadings on their primary factor ($\lambda = 0.67\text{--}0.68$, $p < 0.01$), with no substantial cross-loadings on other factors. In Sample 2, the loadings were more variable ($\lambda = 0.48\text{--}1.04$, $p < 0.01$). See Table 3 for information on factor loadings of introjected regulation items.

Based on the fit statistics and factor loadings, a six-factor model without the approach-oriented introjected regulation items (Model 1 with the reduced item composition) is the most appropriate model in the samples for now.

Model 6, original item composition							
	Intrinsic motivation (λ)	Identified regulation (λ)	Introjected Approach (λ)	Introjected Avoidance (λ)	External social regulation (λ)	External material regulation (λ)	Amotivation (λ)
intro1	-0.04/0.07	0.13/-0.03	0.26/0.55	0.31/0.22	0.24/0.07	0.02/0.08	0.05/0.07
intro2	0.11/-0.05	0.22/0.34	0.07/0.48	0.34/0.03	0.19/0.19	-0.02/-0.05	-0.17/-0.05
intro3	0.02/-0.08	0.02/0.07	0.06/0.21	0.72/0.64	0.14/-0.01	-0.01/-0.01	-0.07/-0.06
intro4	-0.10/0.05	0.02/-0.05	0.12/-0.04	0.62/0.82	0.11/0.10	0.09/0.03	0.14/0.03
Model 1, reduced item composition							
	Intrinsic motivation (λ)	Identified regulation (λ)	Introjected regulation (λ)	External social regulation (λ)	External material regulation (λ)	Amotivation (λ)	
intro3	0.01/-0.14	0.09/0.22	0.68/0.68	0.21/0.19	-0.04/-0.04	-0.09/-0.09	
intro4	-0.07/0.06	0.04/-0.12	0.67/1.04	0.12/-0.04	0.09/0.02	0.10/0.04	
Model 1, expanded item composition							
	Intrinsic motivation (λ)	Identified regulation (λ)	Introjected regulation (λ)	External social regulation (λ)	External material regulation (λ)	Amotivation (λ)	
intro1	-0.01/-0.06	0.11/0.29	0.46/0.49	0.24/0.31	0.02/0.02	0.06/-0.03	
intro2	0.11/0.03	0.23/0.39	0.43/0.44	0.09/0.26	-0.02/-0.04	-0.18/-0.12	
intro3	0.01/-0.12	0.06/0.11	0.83/0.85	0.00/-0.08	-0.04-0.05	-0.08/-0.06	
intro4	-0.06/0.00	0.00/-0.12	0.82/0.82	-0.10/-0.07	0.09/0.06	0.12/0.06	
intro5	0.05/0.07	0.08/0.11	0.20/0.24	0.44/0.53	0.02/0.03	0.11/0.06	
intro6	-0.07/-0.10	0.15/0.28	0.52/0.61	0.26/0.13	-0.14/-0.08	0.04/0.01	
intro7	0.03/-0.02	-0.19/-0.19	0.78/0.69	0.10/-0.04	0.05/0.15	-0.03/0.03	
intro8	-0.08/-0.06	-0.01/-0.08	0.82/0.84	0.03/0.04	0.00/-0.05	0.02/0.03	
Model 6, expanded item composition							
	Intrinsic motivation (λ)	Identified regulation (λ)	Introjected Approach (λ)	Introjected Avoidance (λ)	External social regulation (λ)	External material regulation (λ)	Amotivation (λ)
intro1	-0.03/0.05	0.01/-0.03	0.81/0.64	0.11/0.19	-0.08/-0.05	0.01/0.10	-0.04/0.04
intro2	0.11/-0.08	0.23/0.34	0.18/0.55	0.29/-0.02	0.09/0.12	-0.02/-0.04	-0.18/-0.08
intro5	0.04/0.11	0.03/-0.12	0.49/0.60	-0.06/-0.09	0.27/0.26	0.01/0.03	0.07/0.06
intro6	-0.08/-0.06	0.18/0.12	0.07/0.46	0.36/0.31	0.35/-0.05	-0.14/-0.04	0.07/0.03
intro3	0.01/-0.06	0.11/0.09	0.00/0.18	0.72/0.70	0.15/-0.09	-0.03/0.01	-0.05/-0.06
intro4	-0.06/0.02	0.02/0.02	0.13/-0.02	0.70/0.75	-0.03/0.15	0.10/0.03	0.12/0.05
intro7	0.02/-0.03	-0.18/-0.01	0.17/-0.08	0.65/0.65	0.06/0.20	0.06/0.10	-0.04/0.00
intro8	-0.08/0.04	0.02/-0.10	0.13/0.17	0.68/0.74	0.12/0.06	0.01/-0.02	0.03/0.00
Model 7, expanded item composition							
	G-factor (Intrinsic motivation) (λ)	Specific identified regulation (λ)	Specific introjected regulation (λ)	Specific external social regulation (λ)	Specific external material regulation (λ)	Specific amotivation (λ)	
intro1	0.01/0.21	0.07/-0.25	0.59/0.61	0.37/0.12	0.07/0.12	0.05/0.12	
intro2	0.40/0.48	0.12/-0.25	0.49/0.53	0.13/0.04	0.01/0.06	-0.13/0.03	
intro3	0.07/0.07	0.04/0.14	0.82/0.75	0.08/0.02	0.00/0.02	-0.06/0.07	
intro4	-0.20/-0.11	0.01/0.26	0.79/0.77	0.02/0.19	0.12/0.10	0.09/-0.02	
intro5	0.02/0.17	0.05/-0.35	0.42/0.46	0.42/0.30	0.08/0.12	0.09/0.15	
intro6	0.02/0.19	0.10/-0.12	0.64/0.62	0.27/0.01	-0.08/0.02	0.00/0.07	
intro7	-0.17/-0.17	-0.10/0.25	0.75/0.69	0.09/0.23	0.08/0.17	-0.00/-0.05	
intro8	-0.15/-0.07	0.01/0.14	0.83/0.80	0.12/0.19	0.04/0.02	0.01/-0.02	

Table 3 Standardised factor loadings (λ) of introjected regulation items in different ESEM-estimated MWMS models. Sample 1/Sample 2.

FORMULATING ADDITIONAL ITEMS TO MEASURE THE APPROACH-ORIENTED AND AVOIDANCE-ORIENTED DIMENSIONS OF INTROJECTED REGULATION

Research question 2 concerned new items for measuring introjected regulation. Two new items for approach-oriented introjected regulation and two new items for avoidance-oriented introjected regulation were created and added to Models 1 through 5. Additionally, Model 6 tested two distinct introjected regulation factors (one approach oriented and one avoidance oriented).

In Sample 1, with the expanded item composition, Model 1 had the best fit. The original approach-oriented introjected regulation items had moderate loading on their primary factor ($\lambda = 0.43\text{--}0.46$, $p < 0.01$). Of the new approach-oriented items, intro6 had a similar loading ($\lambda = 0.52$, $p < 0.01$), but intro5 had weak although statistically significant loading ($\lambda = 0.20$, $p = 0.01$) on the factor. Additionally, intro5 had a substantial cross-loading ($\lambda = 0.44$, $p < 0.01$) on the external social regulation factor. Both the original and the new avoidance-oriented introjected regulation items loaded strongly onto their primary factor ($\lambda = 0.76\text{--}0.83$, $p < 0.01$), with no substantial cross-loadings. See Table 3 for information on factor loadings of introjected regulation items and Appendix, Table 3 for fit statistics.

Similarly in Sample 2 with the expanded item composition, Model 1 had the best fit. The original approach-oriented items and the new intro6 had a moderate loading on their primary factor ($\lambda = 0.44\text{--}0.61$, $p < 0.01$), whereas the new intro5 had a modest loading ($\lambda = 0.24$, *ns*). Additionally, intro5 had a substantial cross-loading ($\lambda = 0.53$, $p < 0.01$) on the external social regulation factor. Both the original and the new avoidance-oriented introjected regulation items loaded strongly onto their primary factor ($\lambda = 0.69\text{--}0.85$, $p < 0.01$), with no substantial cross-loadings. See Appendix, Table 4 for information on fit statistics.

In both samples with the expanded item composition, Model 6 had a good fit. In Sample 1, both the original and new approach-oriented introjected regulation items had widely variable loadings on their primary factor ($\lambda = 0.07\text{--}0.81$). The new approach-oriented intro6 had substantial loadings on the avoidance-oriented introjected regulation factor ($\lambda = 0.36$, $p < 0.01$) and on the external social regulation factor ($\lambda = 0.35$, $p = 0.01$). Both the original and new avoidance-oriented items had consistent and relatively strong loadings on their primary factor ($\lambda = 0.65\text{--}0.72$, $p < 0.01$), with no substantial cross-loadings on other factors. In Sample 2, both the original and new approach-oriented introjected regulation items had moderate loadings on their primary factor ($\lambda = 0.46\text{--}0.64$, $p < 0.01$), with one substantial cross-loading of intro2 on the identified regulation factor ($\lambda = 0.34$, $p < 0.01$). Both the original and new avoidance-oriented items had consistent and relatively strong loadings on their primary

factor ($\lambda = 0.65\text{--}0.75$, $p < 0.01$), with no substantial cross-loadings on other factors. See Table 3 for information on factor loadings of introjected regulation items.

Separating introjected regulation into approach- and avoidance-oriented dimensions and using the expanded item composition resulted in a good fit and factor loadings, especially in Sample 2. In Sample 1, there remained challenges with the approach-oriented introjected regulation factor.

Finally, we explored the expanded item composition using the ESEM S-1 modelling approach (Model 7). In both Sample 1 ($\chi^2 = 183.002$, $df = 130$, $p = 0.002$, CFI = 0.982, TLI = 0.964, SRMR = 0.019, RMSEA = 0.039 [90% CI: 0.025–0.052]) and Sample 2 ($\chi^2 = 286.718$, $df = 130$, $p < 0.001$, CFI = 0.974, TLI = 0.949, SRMR = 0.016, RMSEA = 0.044 [90% CI: 0.037–0.051]), the model had acceptable to good fit. The G-factor was clearly defined by strong positive loadings of intrinsic motivation items ($\lambda \geq 0.86$ in Sample 1, $\lambda \geq 0.83$ in Sample 2) and strong negative loadings of amotivation items ($\lambda \geq -0.57$ in Sample 1, $\lambda \geq -0.50$ in Sample 2). Regarding introjected regulation items, one approach-oriented item had positive and statistically significant loading onto the G-factor ($\lambda = 0.40$, $p < 0.01$) in Sample 1, but all four approach-oriented items showed weak to moderate significant loadings on the G-factor in Sample 2 ($\lambda = 0.17\text{--}0.48$, $p < 0.01$). In contrast, two avoidance-oriented introjected regulation items in Sample 1 and one item in Sample 2 had statistically significant negative loadings onto the G-factor. Examination of the S-factors shows that each introjected regulation item has a moderate to strong positive loading on its theoretically assigned factor in Sample 1 ($\lambda = 0.42$ to 0.83 , $p < 0.01$) and in Sample 2 ($\lambda = 0.46$ to 0.80 , $p < 0.01$). See Table 3 for information on factor loadings of introjected regulation items.

CRITERION VALIDITY OF ITEM COMPOSITIONS

Research question 3 concerned the associations between introjected regulatory style and criterion variables. For primary analyses, we chose the original and reduced item compositions in Model 1 and the original item composition in Model 6. Model 1 was selected because it most consistently achieved good fit and a relatively clear loading structure in our samples. Model 6 with the original item composition was chosen to examine the potential differing associations of the distinct introjected regulation factors. In exploratory analyses, we also examined the criterion validity of Model 6 with the expanded item composition.

With Model 1 in Sample 1, associations between introjected regulation and criterion variables were similar but not identical when examined with the original and reduced item compositions. The most pronounced differences were observed in criterion variables tapping on more self-determined experience and wellbeing at work (intrinsic motivation, autonomy satisfaction,

competence satisfaction and work engagement). For example, the association with lower work engagement was stronger when estimated with the reduced item composition ($r_{\text{original}} = -0.03$, *ns* vs $r_{\text{reduced}} = -0.13$, $p < 0.01$). In Sample 2, the original and the reduced item compositions showed quite similar associations with SDT's basic psychological needs. Likewise, the effect of item composition (original vs reduced) on the association between introjected regulation and work performance outcomes remained essentially the same. See Table 4 for full information on the correlative associations.

Given the discussion of the multifaceted nature of introjection, we also performed additional exploratory analyses using Model 6 with the original MWMS item composition. In Sample 1, there were few differing associations between the different introjected regulation factors and criterion variables. The most pronounced difference was in correlations with external social regulation ($r_{\text{approach}} = 0.35$, $p < 0.05$ vs $r_{\text{avoidance}} = 0.55$, $p < 0.001$). In Sample 2, more differences were observed. In addition to a difference regarding external social regulation similar to Sample 1 ($r_{\text{approach}} = 0.34$, $p < 0.001$ vs $r_{\text{avoidance}} = 0.68$, $p < 0.001$), approach-oriented introjected regulation, compared with avoidance oriented, tended to be associated with the more self-determined regulatory styles (e.g., with intrinsic motivation $r_{\text{approach}} = 0.29$, $p < 0.001$ vs $r_{\text{avoidance}} = -0.06$, *ns*), higher need satisfaction (e.g., with competence satisfaction $r_{\text{approach}} = 0.20$, $p < 0.05$ vs $r_{\text{avoidance}} = -0.18$, $p < 0.01$) and better work performance (e.g. self-rated work quality $r_{\text{approach}} = 0.22$, $p < 0.05$ vs $r_{\text{avoidance}} = 0.06$, *ns*). See Appendix, Table 5 for full information on the correlative associations.

We also performed exploratory analyses using Model 6 and the expanded item composition. In Sample 1, avoidance-oriented introjected regulation was more strongly associated with lower work engagement compared to approach-focused introjected regulation

($r_{\text{avoidance}} = -0.18$, $p < 0.01$ vs $r_{\text{approach}} = -0.04$, *ns*). Approach-oriented introjected regulation had a stronger association with external material regulation than avoidance-oriented had ($r_{\text{avoidance}} = 0.14$, *ns* vs $r_{\text{approach}} = 0.26$, $p < 0.01$). In Sample 2, modelling introjected regulation as separate approach- and avoidance-oriented factors altered the associations between introjected regulation and criterion variables. While approach-oriented introjected regulation showed positive, statistically significant associations with basic psychological needs, the avoidance-oriented side of introjected regulation showed negative or nonsignificant associations with basic psychological needs (e.g., with autonomy satisfaction, $r_{\text{approach}} = 0.23$, $p < 0.01$ vs $r_{\text{avoidance}} = -0.12$, $p < 0.01$). For both work performance measures, avoidance-oriented introjected regulation displayed either nonsignificant or significant negative associations with these variables, whereas approach-oriented introjected regulation was associated positively with both work quality ($r_{\text{approach}} = 0.19$, $p < 0.001$ vs $r_{\text{avoidance}} = -0.00$, *ns*) and work performance ($r_{\text{approach}} = 0.20$, $p < 0.01$ vs $r_{\text{avoidance}} = -0.15$, $p < 0.01$). See Appendix, Table 6 for full information on the correlative associations.

DISCUSSION

In the present paper, we examined the factor structure, item composition, and criterion validity of the MWMS. Based on previous studies (e.g., Bieg et al., 2024; Trépanier et al., 2023) and theoretical definitions (Pelletier & Rocchi, 2023; Ryan & Deci, 2017), we especially focused on introjected regulation as a multidimensional and psychometrically challenging phenomenon. We attempted to identify problematic items and test factor structures and criterion validity of the measure with both the full MWMS and the reduced item composition. Additionally, we conducted analyses with a new set of

	AMO	EXM	EXS	ID	IM	AS	CS	RS	WE	EX	WQ	WP	CP
Sample 1													
Introjected regulation (original)	0.04	0.22**	0.56***	0.14	-0.03	-0.10	-0.17	-0.09	-0.11	0.37***	-	-	-
Introjected regulation (reduced)	0.12	0.20**	0.51***	0.05	-0.13**	-0.20**	-0.26***	-0.14	-0.20**	0.38***	-	-	-
Sample 2													
Introjected regulation (original)	-0.05	0.38***	0.47***	0.13	0.14	0.10	-0.16**	0.04	-	-	0.06	0.09	0.03
Introjected regulation (reduced)	0.05	0.37***	0.67***	0.09	-0.09	-0.07	-0.15**	0.02	-	-	0.07	-0.07	0.07

Table 4 Correlations between introjected regulation scales (original and reduced item composition; Model 1) and criterion variables.

AMO = amotivation; EXM = external material regulation; EXS = external social regulation; ID = identified regulation; IM = intrinsic motivation; AS = autonomy satisfaction; CS = competence satisfaction; RS = relatedness satisfaction; WE = work engagement; EX = exhaustion; WQ = work quality; WP = work performance; CP = control by pay.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

items measuring introjected regulation to understand and empirically model the complexity of this regulatory style. The study contributes new information on the significance of avoidance-oriented and approach-oriented items, particularly in the MWMS but also in a more general sense regarding operationalisations of the regulatory styles in SDT.

MAIN FINDINGS

The first research question concerned the most appropriate factor structure for the MWMS. The results of the present study do not support reducing the factors of the MWMS to amotivation, external regulation, introjected regulation, and autonomous motivation (cf. [Trépanier et al., 2023](#)). A six-factor model (Model 1), in which all regulatory styles were modelled separately, provided excellent or good fit, regardless of item composition. However, the approach-oriented items of introjected regulation were found to be problematic, either by having weak loadings on their primary factor or by having substantial cross-loadings on adjacent factors. This is in line with the observations of [Trépanier et al. \(2023\)](#).

The second research question concerned the formulation of new items for introjected regulation. Our new items received mixed support. Bifactor S-1 modelling with the expanded item composition (Model 7) showed that each introjected regulation item (both old and new) retained substantial loading onto their specific introjected regulation factor. This suggests that the items share substantial common variance, perhaps anchored in ego-involvement and partially internalised external contingencies. Examining cross-loadings of the introjected regulation items showed that approach-oriented and avoidance-oriented items of introjected regulation seem to differ in terms of the degree of self-determination they reflect. Seeking and proving one's self-worth seems to represent a slightly more self-determined side of behavioural regulation than doing something to avoid losing one's self-esteem and self-worth.

A seven-factor model in which introjected regulation was modelled with two factors (approach-oriented and avoidance-oriented introjected regulations; Model 6) demonstrated good or excellent fit. However, some approach-oriented items demonstrated modest loadings on their designated factor, although mainly in Sample 1. This suggests that despite some promising results, our set of new items did not solve the challenges with approach-oriented items. From a purely psychometric view, the best solution could be omitting the approach aspect of introjected regulation, although this would come at the cost of conceptual fidelity.

The third and final research question concerned item composition and the associations between introjected regulation and other regulatory styles, relevant

antecedents, and outcomes. Despite the limitation discussed above, correlational analyses suggest that approach-oriented items and modelling approach-oriented introjected regulation as its own factor may have some value. Especially in Sample 2, approach- and avoidance-oriented introjected regulation factors had differing associations with some criterion variables. Generalisation of this observation is discouraged by the poor performance of some approach-oriented items in Sample 1.

THEORETICAL IMPLICATIONS

Conceptualising and modelling dimensions of motivation have been actively discussed (e.g., [Bieg et al., 2024](#); [Bureau et al., 2023](#); [Howard, Gagne, & Bureau, 2017](#); [Howard et al., 2018, 2020](#); [Trépanier et al., 2023](#)). Based on the present study, modelling the structure of motivation with separate but related regulatory style factors is defensible on both theoretical and empirical grounds.

We tested multiple alternative models combining regulatory styles, addressing whether theoretically adjacent regulatory styles should be aggregated at the level of operationalisation. It is a very common practice to operationalise external regulation as one factor (Model 2), and doing so may be theoretically sound. Both external material and external social regulation represent a type of motivation in which extrinsic environmental contingencies are fully responsible for energising the individual's behaviours ([Pelletier & Rocchi, 2023](#); [Ryan & Deci, 2017](#)). However, some results of the present study indicate that external material and social regulations may be differently associated with introjected regulation. Introjected regulation shares more variance with external social regulation than with external material regulation. It is possible that the avoidance aspects of introjected regulation and socially induced external motivation are based on the same motivational processes.

Based on theory, it is easy to see why self-induced, guilt-driven internal pressure and externally induced social pressure have cross-loadings when modelled empirically: Both regulatory styles stem from an intricate relationship of fear of disappointing or gaining approval from someone – either from oneself or others – leading to some degree of ego-related contingency (see [Ryan & Deci, 2017](#)). This underscores the socially contingent nature that these two regulatory styles share.

Unlike external regulation based on material rewards, rewards that induce external social regulation are intangible and interpersonal (i.e., socially mediated; e.g., receiving approval and acceptance from one's social group). Given the interpersonal nature of this motivation type, it is understandable why external social regulation and avoidance-oriented introjected regulation correlate quite strongly with each other. In fact, in their discussion of introjected regulation, Ryan and Deci

(2017, pp. 185–186) acknowledge and emphasise the socially contingent nature of introjection, whether the rewards energising introjected regulation are actual or only imagined (e.g., others judging a person). So, doing something because of imagined expectations of others seems to share conceptual overlap with doing something out of socially induced pressure, which can explain these findings.

The present study similarly concerns whether the commonly used method of combining identified regulation and intrinsic motivation into autonomous motivation (Model 3) is a suitable approach. Even if the fit was satisfactory, combining them may be conceptually problematic. Intrinsic motivation and identified regulation do share common characteristics (e.g., a high degree of self-determination), but there is a qualitative difference between them. While identified regulation is a relatively self-determined motivational quality, the instrumentality of an activity rather than interest towards it directs behaviour (Gagné & Deci, 2005). Intrinsic motivation, on the other hand, is based on interest in and enjoyment of the activity itself (Lehtivuori, 2023; Ryan & Deci, 2017).

Despite conceptual tensions, the operationalising autonomous motivation with items from intrinsic motivation and identified regulation is defensible on practical and empirical grounds. The associations between intrinsic motivation and identified regulation have been strong, and their associations with criterion variables have been similar (Howard et al., 2018; Van den Broeck et al., 2016, 2021). One factor of autonomous motivation instead of two highly correlated factors reduces multicollinearity problems. However, when conceptual clarity is important, such as when examining how socio-contextual factors affect intrinsic motivation and identified regulation (see, e.g., Lehtivuori, 2023), it is advisable to operationalise and estimate these as separate regulations. Nevertheless, a researcher should keep in mind that by omitting or combining regulatory styles, fidelity to the theory is weakened.

Issue of theoretical fidelity can also be raised regarding items selected to measure regulatory styles. Particularly, introjected regulation is challenging to operationalise, because it is a somewhat conflicted phenomenon (Pelletier & Rocchi, 2023; Ryan & Deci, 2017). It entails contingent ego-involvement, which is theorised to arise from two separate yet intertwined motivational processes: preserving and enhancing one's ego (Deci & Ryan, 1985; Ryan, Koestner, & Deci, 1991; see also Nicholls, 1984). The avoidance aspect of introjected regulation seems to stem from one's aim to minimise risk to one's self-worth, whereas the ego-enhancement side of introjected regulation tries to maximise it (Assor, Vansteenkiste, & Kaplan, 2009). Additionally, it is possible that avoidance-oriented introjections represent a harsher (and thus more internally controlling) form of it, as the

'stakes' to one's contingent ego are higher than when one is doing the activity to try to boost one's ego.

Introjected regulation has been associated with both positive and negative outcomes (Van den Broeck et al., 2021) and varying operationalisations may have affected the observed associations in different studies (Bieg et al., 2024). Omitting the approach-oriented introjection items may clarify the measurement of introjected regulation and produce more consistent associations with covariates. However, this clarification and consistency may have too high a cost. Even if the psychometric properties of the measure are better in a technical sense, one can argue that questionnaires assessing introjected regulation also need approach-oriented items to fully cover the phenomenon.

Additional insight into this question was provided by bifactor ESEM S-1 modelling (Model 7), which showed that the loadings of avoidance-oriented items were predominantly negative, whereas approach-oriented items had positive loadings on the G-factor. This supports the idea of separating introjected regulation into two sub-dimensions. We see that this reflects the contradictory and tense or strained nature of this internally controlling form of this regulatory style: proving to yourself that you are worthy or avoiding negative (imagined) outcomes (e.g., Ryan, Koestner, & Deci, 1991).

Consequently, our exploratory analyses indicate the possibility of introjection's multidimensional nature, which aligns with the theoretical conceptualisation of this regulation type (Deci & Ryan, 2000; Ryan, Koestner, & Deci, 1991). If introjected regulation truly is a multidimensional regulatory style, it should be acknowledged and operationalised as such (Bieg et al., 2024), and inconsistency of results should be considered not a problem but rather a research question.

Another important question pertains to how some items representing introjected regulations are worded and subsequently interpreted. Interestingly, one of the original items concerning pride (intro2) performed variably. This suggests that future research should try to disentangle the ego-contingent pride motive from the authentic or sincere form of pride when developing introjected regulation items (see Tracy & Robins, 2007a, 2007b). Being genuinely proud of one's accomplishment or taking pride in one's quality of work may have partially different motivational underpinnings than engaging in a task to bolster one's (fragile) ego and self-esteem (Tracy & Robins, 2007b; see also Van den Broeck et al., 2021). Perhaps approach-oriented introjected regulation taps more into the ego-contingent side of the pride motive, whereas being genuinely proud of one's accomplishment that bears personal significance to one is more reflective of identified regulation (see Ryan, Koestner, & Deci, 1991). Although this theorising was not investigated in the present study, it offers an avenue for future development of the understanding of introjected regulation.

We suggest that the hypothesised multidimensionality of introjected regulation should be better considered in future operationalisations. Overall, the present study contributes by advancing the understanding of the recommended way of modelling the MWMS and SDT's motivation continuum. Our findings suggest that conceptualising the MWMS and its regulatory styles as separate but interrelated factors is empirically warranted and conceptually supported. Our results do not support either a suggestion that theoretically adjacent regulatory styles should be aggregated at the level of operationalisation or the idea that some regulatory styles should be combined as higher-order motivational constructs as suggested by Trepanier et al. (2023). We have also discussed the dimensionality of introjected regulation and suggested that this regulatory style could be better measured as two separate factors, although further item development is warranted.

PRACTICAL IMPLICATIONS

Most practical implications of the present study concern research. First, we cannot recommend omitting approach-oriented introjected regulatory style items from the MWMS or other measures assessing motivational dimensions in SDT. On the contrary, we suggest that the item composition be further examined for the possibility of better coverage of introjected regulation. Bieg et al. (2024) propose that two aspects of the regulatory style should be measured: the valence of the experience (positive or negative; corresponds to the approach or avoidance orientation in MWMS) and the source of the approval one is seeking. The latter is not present in the MWMS. Therefore, we encourage researchers to consider expanding the item selection with which introjected regulation is measured.

Second, we suggest that when reading and reporting studies, the measurement of introjected regulation be considered. With the MWMS so far, this is not a problem. However, if using only the avoidance-oriented introjected regulation items becomes more prevalent, the observed associations with wellbeing will probably be weaker and associations with ill-being stronger than with the full MWMS. The results as such are not a problem, but operationalisation that omits relevant aspects may be. More generally, this applies to all similar measurement instruments.

Third, it must be noted that the approach-oriented items do not seem to work particularly well. This applies to both the original items and the items developed for this study, although the B-ESEM S-1 model suggests they share substantial specific variance. This calls for further development of items or ways to model the regulatory style. The new avoidance-oriented items of the present study may serve as a basis for examining expanded coverage of avoidance-oriented introjected regulation. The new approach-oriented items in the present study are not a suitable choice for high-stakes data collection.

STRENGTHS AND LIMITATIONS OF THE PRESENT STUDY

There are some limitations. They include using two samples that did not fully represent the Finnish working population. Females were over-represented in Study 1, whereas Study 2 focused on a single, highly educated occupational group. While these issues may increase the risk of chance findings and limit the generalisability of our findings, two samples with a similar general pattern of findings give some assurance against these potential issues. Still, we suggest that the present findings regarding the best way to model the MWMS should be replicated. Furthermore, the results of Trépanier et al. (2023) concerning the approach-oriented items in their samples were very similar to the results of the present study, lending some credibility to the interpretation that the observation is not merely a coincidence.

A limitation concerning the analytical strategy is reliance on self-reporting, which increases the risk of common method variance. Furthermore, studies with more diverse outcome variables are needed to examine the validity of different introjection factors.

CONCLUSION AND FUTURE RESEARCH DIRECTIONS

We consider the need to examine introjected regulation as a conflicted and potentially multidimensional behavioural regulatory style as the most important conclusion of the present study. This calls for theoretical, methodological, and empirical work when new items and models are developed in the framework of SDT.

DATA ACCESSIBILITY STATEMENT

Relevant data will be available from the authors upon reasonable request.

ADDITIONAL FILE

The additional file for this article can be found as follows:

- **Appendix.** Tables 1–6. DOI: <https://doi.org/10.16993/sjwop.292.s1>

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COMPETING INTERESTS

The authors have no competing interests to declare.

AUTHOR CONTRIBUTIONS

Petri Karkkola contributed to the design of the study, acquisition of the data, analysis and interpretation of the data and drafting and editing the manuscript.

Aki Lehtivuori contributed to the design of the study, acquisition of the data, analysis and interpretation of the data and drafting and editing the manuscript.

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