

A TEMPORAL ANALYSIS OF THE RELATION BETWEEN ORGANISATIONAL COMMITMENT AND WORK MOTIVATION

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Meyer, Becker, and Vandenberghe (2004) recently proposed a model linking work motivation to organisational commitment. Two studies tested these links prospectively with employees from a Canadian telecommunications company and from an Italian autoparts company. Self-determination theory provided the framework to measure work motivation, such that measures of external, introjected and identified regulation, and intrinsic motivation were linked to Allen and Meyer's (1990) and to O'Reilly and Chatman's (1986) tripartite models of organisational commitment. We hypothesised that Time 1 motivation would be related to changes in commitment over time, but that Time 1 commitment would not be related to motivational changes over time. Results supported hypotheses for affective and normative commitment, but not for continuance commitment.

Organisational commitment has become an important concept in organisational behaviour over the past few decades. It is defined as a psychological state or a force that binds the individual to a target, in this case the organisation (Allen & Meyer, 1990; Meyer, Becker, & Van Dick, 2006). The breadth of this definition has allowed researchers to examine different types of commitment to organisations, their development, and their effects on people and organisations.

Allen and Meyer (1990) proposed a tripartite conceptualisation of organisational commitment. *Affective* commitment is defined as the emotional attachment and identification a person has to an organisation, and that person's involvement in that organisation. For example, one can feel proud to be a member of organisation X and truly want X to be successful. *Normative* commitment is defined as a feeling of obligation or loyalty toward an organisation. For example, one can feel loyal to a family business or indebted to

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an organisation because it has paid for one's education. *Continuance* commitment is defined as the perceived cost of leaving an organisation. For example, one can stay in an organisation in order not to lose a good pension plan, or because one has poor job alternatives (Meyer, Stanley, Herscovitch, & Topolnytsky, 2002).

O'Reilly and Chatman (1986) proposed a different tripartite conceptualisation of organisational commitment based on Kelman's (1958) theory of attitude change. To them, organisational commitment is the attitude one has about the organisation that can develop through one of three mechanisms. The first mechanism, *identification*, represents feeling like an integral member of the organisation, having a sense of belonging, and a sense of pride. The second mechanism, *internalisation*, represents acceptance of organisational values, and a willingness to adhere to these values at work. The authors often merge these two subscales to form a single dimension that they call normative commitment. In this paper, however, we will give it a different name to avoid confusing it with Allen and Meyer's (1990) normative commitment concept, and call it *integrative* commitment. The third mechanism, *instrumentality*, represents a willingness to remain in the organisation only to the extent that one gets something in return, such as satisfying pay, benefits, or other rather extrinsic advantages. It is related to strong reward systems (Caldwell, Chatman, & O'Reilly, 1990) and to turnover (O'Reilly & Chatman, 1986).

It is relatively easy to see the similarities between the two models of organisational commitment. Affective commitment is likely to be correlated positively with internalisation and identification to the organisation. Normative commitment is also likely to be somewhat related to these two dimensions, albeit less strongly. Continuance commitment is likely to be positively related to instrumental commitment (even though one focuses on costs and the other on gains). Becker (2004) examined the overlap between the constructs offered by the two theories of commitment and asked respondents to complete both measures of commitment. When all forms and bases of commitment were factor-analysed, he found a two-factor structure where affective, normative, identified, and internalised commitment load onto one factor, and continuance commitment loads onto a second factor (instrumental commitment was not measured). However, when examining each scale separately, he found a three-factor solution for the Allen and Meyer (1990) measure, and a two-factor solution for the O'Reilly and Chatman (1986) measure (identification and internalisation). His research therefore shows the conceptual overlap between the two theories of organisational commitment.

The goal of the present studies was to examine the relation between organisational commitment and work motivation. We chose a theory of motivation that conceptualises motives in ways similar to how organisational commit-

ment has been conceptualised. We also wanted to examine how different forms of organisational commitment develop. How does one come to internalise and identify with an organisation? How does one come to feel obliged to, or stuck in, an organisation? Self-determination theory (SDT; Deci & Ryan, 1985, 2000, 2008; Gagné & Deci, 2005; Gagné & Forest, in press) proposes the concept of internalisation to understand how work motives develop, and consequently, we propose and test whether the different forms of organisational commitment will emerge from such motives.

Self-determination theory

Self-determination theory (SDT; Deci & Ryan, 1985, 2000) distinguishes between intrinsic motivation and extrinsic motivation. Intrinsic motivation refers to doing an activity for its own sake, because people find the activity itself to be interesting and inherently satisfying. In contrast, extrinsic motivation refers to doing an activity for an instrumental reason. The theory also proposes that a psychological process is involved in the acquisition and acceptance of new values or goals, which leads people to become autonomously motivated to engage in behaviours that express these values and goals. This process is called internalisation, defined as "the active assimilation of behavioural regulations that are originally alien or external to the self" (Ryan, 1995, p. 405). Internalisation does not imply that an extrinsically motivated person becomes intrinsically motivated. Instead, SDT proposes that there are different types of extrinsic motivation that can be relatively controlled by external factors, or that can be relatively autonomous, that is, regulated through a person's acquired goals and values. These types of motivation can be aligned along a continuum representing the degree to which they have been internalised.

At the low end lies *external regulation*, which refers to doing an activity to obtain rewards or to avoid punishments. Behaviour so regulated is therefore completely externally controlled. Next, *introjected regulation* refers to the regulation of behaviour through self-worth contingencies like ego-involvement and guilt. It involves taking in a regulation so that it becomes internally pressuring, and thus involves only partial internalisation that remains controlling, not volitional. People engage in a behaviour or commit to an activity out of guilt or compulsion, or to maintain their self-worth (Koestner & Losier, 2002). Next, *identified regulation* refers to doing an activity because one identifies with its value or meaning, and accepts it as one's own, which means that it is autonomously regulated. People engage in a behaviour or commit to an activity based on its perceived meaning or its relation to personal goals (Koestner & Losier, 2002). Identified regulation

differs from intrinsic motivation in that the activity is done not so much for its own sake (because it is interesting and fun), but for the instrumental value it represents. Identified regulation is driven by values and goals, whereas intrinsic motivation is driven by emotions that emerge while engaging in the activity.

In sum, when putting these forms of motivation on the continuum of internalisation, external and introjected regulation represent *controlled motivation*, whereas identified regulation and intrinsic motivation represent *autonomous motivation*. Research in different domains, such as education (Williams & Deci, 1996), sports (Vallerand & Fortier, 1998), work (Blais, Brière, Lachance, Riddle, & Vallerand, 1993), and health care (Williams, Grow, Freedman, Ryan, & Deci, 1996), has supported that the types of motivation form a quasi-simplex pattern that represents variation in underlying internalisation, which means that adjacent subscales on the continuum correlate positively while non-adjacent subscales are uncorrelated.

It is important to note that, although the concept of identification within commitment theories and within self-determination theory appears to be the same, the object of the identification differs. Identified regulation as defined in self-determination theory focuses on endorsing the value of engaging in a behaviour as one's own. Identification as defined in the commitment literature focuses on how organisational membership becomes part of one's identity or self-concept. We must also acknowledge the similarities and differences between identified regulation and organisational identification (Ashforth & Mael, 1989). Organisational identification is the "extent to which individuals define the self in terms of the membership in the organisation" (van Knippenberg & Sleebos, 2006, p. 572; see also Meyer et al., 2006 for a discussion of the difference between commitment and social identity, which is similar to organisational identification). Although van Knippenberg and Sleebos (2006) argue that identification to the organisation leads to the incorporation of values, norms and interests into the self, self-determination theory goes further by saying how this happens. Organisational identification theory does not specify if identification to the organisation occurs before or after values, norms and interests have been internalised. In contrast, self-determination theory says clearly that identification takes place because a value or an interest has been internalised. Moreover, the definitions of the self differ in the two theories: whereas the self is defined as self-concept in organisational identification theory (how you view yourself), the self is defined as an integrative organismic mechanism in self-determination theory (akin to Sperry's concept of consciousness, and James concept of will; see Deci, 1980). These different definitions of self also have consequences for the definitions of identification. Based on these differences, we expect these different constructs to be related but distinct.

Relations between motivation and commitment

Recently, Meyer and colleagues (2004), and Meyer and Herscovitch (2001) have proposed that organisational commitment is actually a component of work motivation, an argument that follows naturally from their revised definition of commitment, which now asserts that the target of commitment can be both an entity and the outcome of a course of action relevant to that target (Meyer & Herscovitch, 2001). We argue that it is still important to distinguish between motivation and commitment by treating them as constructs with different targets. We therefore propose that the target of commitment is an entity (e.g., organisation, person or event), whereas the target of motivation is a course of action (for which movement is necessary).

Meyer and colleagues (2004) also proposed that the different forms of motivation within the SDT framework and the three forms of commitment in their model both fall along a continuum of increasing internalisation extending from externally driven to internally regulated motivation and commitment. We similarly argue that there is considerable conceptual overlap between types of motivation and types of commitment. Affective commitment (and integrated commitment) represents a *desire* to follow a course of action (Meyer & Herscovitch, 2001), and so does both intrinsic and identified motivation. Normative commitment represents an internalised feeling of *obligation*, and so does introjection. Continuance commitment represents a focus on *pressure* by the calculation of costs associated with failure to follow a course of action, and instrumental commitment represents a focus on gains associated with helping the organisation. Both therefore have a focus on external and more tangible factors that influence engagement, which is similar to external regulation.

In a model delineating how goal setting is related to performance, Meyer and colleagues (2004) proposed that commitment leads to increased autonomous motivation, which will lead to the setting of more difficult goals, greater effort, and higher performance. Similarly, Meyer and colleagues (2006) propose that social identity leads to the adoption of either controlled or autonomous motivation, although they also assume that reciprocal effects are likely to exist. The argument therefore goes in one main direction; when people feel attached to, obliged toward, or stuck into, an organisation, they will want to, feel they should, or feel they have to, accomplish their work tasks (Meyer & Herscovitch, 2001). Meyer et al.'s (2004) explanation of this proposition, however, could possibly imply different causal paths. For example, they say that: "[Affective commitment *develops through*] any personal or situational variable that contributes to the likelihood that an individual will (a) become involved (intrinsically motivated, absorbed) in a course of action, (b) recognise the value-relevance of association with an entity or pursuit of a

course of action, and/or (c) derive his or her identity from association with an entity, or from working toward an objective" (Meyer et al., 2004, p. 316).

This implies that motivation would be one of the bases through which commitment develops: the bases they describe represent exactly three forms of motivation proposed in SDT: intrinsic motivation, identified regulation, and integrated regulation¹ (Deci & Ryan, 1985; 2000; 2008).

We propose that motivation is a basis for organisational commitment; it is the nature of the motivation to work that will lead to the development of certain types of commitment to an organisation (because of the internalisation that will take place). In other words, we propose that when people want to, feel they should, or feel they have to, accomplish work tasks, they will either become attached to, feel obliged toward, or feel stuck into, an organisation. As Meyer and colleagues (2004) argue, however, it is very likely that motivation and commitment will have reciprocal relations over time. Their model includes indirect paths through which motivation can feedback into increased organisational commitment through goal setting and performance. We would argue for adding direct paths from motivation to commitment, which would in turn lead to performance.

Some research points to how autonomous motivation is likely to be related to organisational commitment. Vallerand, Fortier, and Guay (1997) found that adolescents who endorsed autonomous reasons for attending high school were less likely to want to drop-out, and to actually drop-out of high school. Relatedly, Green-Demers, Pelletier, and Ménard (1997) found that correlations between engagement in environmental behaviour and autonomous motivation were stronger for difficult environmental behaviours than for easy behaviours. Gagné (2003) found that a work climate that supports basic needs for autonomy, competence, and relatedness (which are associated with higher autonomous motivation; Deci & Ryan, 2000) was negatively related to turnover in volunteer workers. Millette and Gagné (2008) also found that volunteer workers' autonomous motivation was positively associated with their engagement in their volunteer work. Finally, Bono and Judge (2003) found a positive relationship between autonomous reasons for pursuing work goals and affective commitment.

¹Integrated regulation is another type of motivation that is sometimes included in the continuum. However, when we attempt to measure it, it is very difficult to separate it from identified regulation. For this reason, it is not in either the Blais nor the Gagné scales.

Hypotheses

We propose four hypotheses about the relations between work motivation and organizational commitment to be tested in two longitudinal studies.

H1: Autonomous forms of motivation (identification and intrinsic motivation) will be more strongly and positively correlated to affective commitment than will controlled motivation (introjected and external regulation).

H2: Introjected regulation will be more strongly and positively correlated to normative commitment than will autonomous motivation and external regulation.

H3: External regulation will be more strongly and positively correlated to continuance commitment than will autonomous motivation and introjected regulation.

H4: Motivation will predict changes in organisational commitment. Organisational commitment will not predict changes in motivation.

Study 1

The purpose of this study was to test the hypotheses using O'Reilly and Chatman's (1986) tripartite conceptualisation of organisational commitment. Because there is no equivalent to normative commitment in this theory, H2 was not tested in this study.

Method

Participants

Employees from two departments of a Canadian telecommunications company completed a questionnaire on two separate occasions. At Time 1, we obtained complete data from 158 employees (technicians and sales-representatives), and at Time 2 (13 months later) we obtained complete data from 98 employees, 62 of which had completed Time 1 as well. Average tenure in the company was 12.4 years (range 3 months to 39.7 years), and the average age of the workers was 36.77 (range 20 to 60 years old). Age and tenure did not influence results, and so are not discussed further. All workers were unionised, and all were native French speakers.

Procedure

Employees received envelopes containing a questionnaire packet, a stamped return envelope, a cover letter explaining the study and a consent form stressing the fact that their participation was confidential and voluntary. They were asked to mail the questionnaires back directly to the university once completed to ensure that their managers would not see their responses. Aggregate results were fed back to the company, and written reports were made available to all respondents. The same procedure was used at Time 2.

Measures

Work motivation

We used the French validated Work Motivation Inventory (Blais et al., 1993), where employees are asked to rate reasons for doing the job they do, representing the different forms of motivation on a 1 (Completely disagree) to 7 (Completely agree) scale. Subscales included external regulation (4 items, e.g., "Because I make money at this job", $\alpha = .81$ at Time 1 and $\alpha = .38$ at Time 2), identification (4 items, e.g., "Because it is the type of job I chose to realise my career goals", $\alpha = .79$ at Time 1 and $\alpha = .90$ at Time 2), and intrinsic motivation (12 items, e.g., "Because I have a lot of fun at this job", $\alpha = .95$ at Time 1 and $\alpha = .94$ at Time 2). Identified and intrinsic motivation were merged to test hypotheses ($\alpha = .96$ at both Time 1 and 2). We merged the last two subscales into autonomous motivation because they were highly correlated and because we did not need to distinguish them to test our hypotheses. Furthermore, Gagné, Forest, Gilbert, Aubé, Morin, and Malorni (2008) showed in a confirmatory factor analysis that, for another measure of work motivation (used in Study 2), we can represent its structure by first-order factors that represent each subscale as well as by a second-order structure that merges identified and intrinsic motivation together, and another that merges external and introjected regulation together. Introjection was not included since we did not have a measure of normative commitment.

Organisational commitment

We used O'Reilly and Chatman's (1986) measure, which includes integrative commitment ($\alpha = .94$ at Time 1 and $\alpha = .91$ at Time 2), composed of two subscales labelled internalisation (5 items, e.g., "Since joining this organisation, my personal values and those of the organisation have become more similar") and identification (3 items, e.g., "I talk up this organisation to my friends as a great organisation to work for"), as well as instrumental commitment (4 items; "Unless I am rewarded for it, I don't see any reason to put

extra effort in my work"; $\alpha = .41$ at Time 1 and $\alpha = .34$ at Time 2), rated on a 1 (Completely disagree) to 7 (Completely agree) scale. Items were translated to French by a graduate student and back translated by another graduate student.

Because of internal reliability problems with the measures of external regulation and instrumental commitment, we decided not to further test H3 with this data set.

Results and discussion

We conducted confirmatory factor analyses in order to evaluate the measurement model. We used AMOS 7.0 (Arbuckle, 2006) and the "random assignment" approach suggested by Little, Cunningham, Shahar, and Widman (2002) to allocate items to the item-parcels used in the first order partial disaggregation model (Bagozzi & Edwards, 1998; Landis, Beal, & Tesluk, 2000; Williams & O'Boyle Jr., 2008). The principal advantages of the partial disaggregation model are that it reduces the number of parameters to be estimated and at the same time tends to decrease measurement error (Bagozzi & Edwards, 1998). We used subscale assignment for integrative commitment (three parcels: one for identification comprising three items, and two parcels for internalisation, one comprising three items, the other two, randomly assigned). Four parcels were created for autonomous motivation. One for the identification subscale, comprising four items, one for the stimulation subscale of intrinsic motivation, one for the actualisation subscale of intrinsic motivation, and one for the learning subscale of intrinsic motivation. The results fully supported a two-factor model for integrative commitment and autonomous motivation and showed that this model presented a significantly better fit to the data than a one-factor model.

Means, standard deviations, and correlations are presented in Table 1. At Time 1, integrative commitment was positively related to autonomous motivation, supporting H1. We could not compare this correlation with the one with external regulation, because of internal reliability problems we had with this subscale. At Time 2, integrative commitment was positively related to autonomous motivation, supporting H1. A cross-lagged analysis of the zero-order correlations revealed a temporal pattern between motivation and commitment. Autonomous motivation at Time 1 was positively related to integrative commitment measured 13 months later, $r = .42$, $p < .001$, but integrative commitment at Time 1 was not correlated to autonomous motivation at Time 2, $r = .07$, *ns*. Therefore, we found good support for part of H4.

Table 1
Study 1: Means, standard deviations, and cross-sectional correlations

Variable	Mean T1	SD T1	Mean T2	SD T2	1	2
1. Autonomous motivation	4.67	1.27	4.83	1.71		.66***
2. Integrative commitment	4.41	1.48	4.25	1.48	.51***	

Note. $N = 62$. Correlation for Time 1 is below and for Time 2 above the diagonal. *** $p < .001$

To test H4 more stringently, we conducted a cross-lagged analysis through path analysis with LISREL (Jöreskog, 1979). Like Van Dick, Grojean, Christ, and Wieseke (2006), we accepted a significance value of $p < .10$ because of our small sample size. Results are summarised in Figure 1. We found support for the hypothesis that autonomous motivation T1 leads to higher integrative commitment T2. However, even though we obtained a two-factor structure in CFA, we had a multicollinearity problem in this analysis that led to a significant negative relation between integrative commitment T1 and autonomous motivation T2. Comparing this significant negative relation to the zero-order correlation, which was positive and non-significant, indicates a suppression effect, whereby the relation between integrative commitment and autonomous motivation at Time 2 is inflated in the opposite direction because of apparent multicollinearity between the observed indicators used in this analysis (MacKinnon, Krull, & Lockwood, 2000).

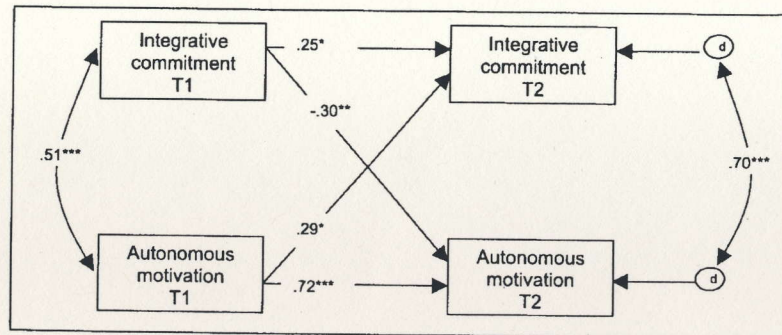


Figure 1

Cross-lagged analysis of the relation between commitment and motivation, Study 1
Note. $^+p < .10$; $*p < .05$; $***p < .001$

Study 2

To replicate these results, we conducted a second study with three variations. First, we used a sample of Italian workers to generalise the results in a different country and different industry. Second, we used Meyer and Allen's (1997) tripartite conceptualisation of commitment, which included adding normative commitment to test H2, and solving the low reliability problem with instrumental commitment, and the multicollinearity problem with autonomous motivation. Third, we changed the measure of motivation to take care of the low internal consistency problems with external regulation.

Method

Participants

Employees from a Northern Italian plant that produces motor components completed a paper survey (containing the motivation and commitment scales) at home, after their work shift on two separate occasions. At time 1, the Italian plant was undergoing a merger (passing from a US-based company to a Germany-based company) and we obtained complete data from 172 employees (for a response rate of 48%). At Time 2, six months later, we obtained complete data from 129 employees (for a response rate of 35%), 81 of which had completed Time 1 as well. The age of the 81 respondents ranged from 20 to 60 years, with a mean age of 41 years ($SD = 8.93$) and 77% of respondents were male. The sample was composed of 71% blue-collar workers, 25% white-collar workers and 4% manager. Tenure in the organisation ranged from some months to 37 years ($M = 13.13$, $SD = 9.1$), and tenure on the job ranged from some months to 40 years ($M = 12.59$, $SD = 8.7$).

Procedure

Both times, at the end of their work shift, employees received envelopes containing a questionnaire packet, a cover letter explaining the study and a consent form. The employers gave back the questionnaires directly to the researcher in the porter's lodge once completed. Aggregate results were fed back to the company at the end of project, and written reports were made available to managers and local unions.

Measures

Work motivation

Respondents completed the Motivation at Work Scale (Gagné et al., 2008) on a 1 (completely false) to 5 (completely true) scale. This newly developed measure attempts to improve over the Blais scale by augmenting the internal reliability of the scales and improve the face validity of the items. Items were responses to the question "Why do you do this job?". Subscales include external regulation (4 items, e.g., "Because this job provides security", $\alpha = .73$ at Time 1, $\alpha = .88$ at Time 2), introjected regulation (5 items, e.g., "Because I have to be the best in my job, I have to be a winner", $\alpha = .85$ at Time 1, $\alpha = .89$ at Time 2), identified regulation and intrinsic motivation. We merged the last two subscales into autonomous motivation because they were highly correlated and because we did not need to distinguish them to test our hypotheses (11 items, e.g., "Because this job fits my personal values, Because this job is very interesting", $\alpha = .94$ at both Time 1 and 2). As mentioned in Study 1, Gagné et al. (2008) showed in a CFA that this measure can be represented by first-order factors that represent each subscale as well as by a second-order structure that merges identified and intrinsic motivation together, and another that merges external and introjected regulation together. This scale was validated in French and in English and was translated into Italian by a professional translator.

Commitment

We used two subscales of Meyer and Allen's (1997) measure, affective (6 items, e.g., "This organisation has a great deal of personal meaning for me", $\alpha = .79$ at Time 1, $\alpha = .88$ at Time 2) and normative (6 items, e.g., "This organisation deserves my loyalty", $\alpha = .78$ at Time 1, $\alpha = .79$ at Time 2). We used Powell and Meyer's (2004) measure for continuance commitment (9 items, e.g., "I would not leave this organisation because of what I would stand to lose", "One of the few negative consequences of leaving my organisation would be the scarcity of available alternatives", $\alpha = .78$ at Time 1, $\alpha = .81$ at Time 2). All items were measured on a 1 (strongly disagree) to 5 (strongly agree) scale.

Results and discussion

We conducted confirmatory factor analyses like in Study 1. We created three random parcels for affective and normative commitment. We also created 3 parcels for continuance commitment, based on low alternatives (1 par-

cel of 3 items) and high sacrifice (2 parcels of 3 items each).² We created 4 random parcels for autonomous motivation and 2 parcels for introjected regulation and for external regulation. For autonomous motivation and affective commitment, a two-factor structure fitted the data better than a one-factor model. For normative commitment and introjected regulation, a two-factor structure also fitted the data better than a one-factor model. For continuance commitment and external regulation, a three-factor structure representing high sacrifice, lack of alternatives, and external regulation fitted the data better than a one-factor model and a two-factor model (i.e., where the two sub-components of continuance commitment were merged).

Table 2 presents means, standard deviations and correlations between the variables. It is remarkable that despite major organisational changes, the means and correlations on motivation and commitment did not change much over time. Data provided good support for the first three hypotheses. At Time 1, affective commitment was positively related with autonomous motivation. This correlation was significantly higher than the one with external regulation, $t(78) = 3.69, p < .01$, but was not significantly higher than the one with introjected regulation, $t(78) = 1.67, ns$. Therefore, we found partial but relatively strong support for H1. Normative commitment was positively related with introjected regulation. This correlation was equal to the one with autonomous motivation, $t(78) = .00, ns$, and significantly higher than the one with external regulation, $t(78) = 2.77, p < .01$. Therefore we found partial support for H2. High sacrifice was positively related to external regulation. This correlation was equal to the one with autonomous motivation, $t(78) = 0.07, ns$, and to the one with introjected regulation, $t(78) = 0.25, ns$. Low alternatives was also positively related to external regulation. This correlation was higher than the one with autonomous motivation, $t(78) = 4.91, p < .01$, and the one with introjected regulation, $t(78) = 2.26, p < .05$. We therefore found support for H3 only for the low alternatives component of continuance commitment.

²Bentein, Vandenberg, Vandenberghe, and Stinglhamber (2005) proposed that continuance commitment could be better characterised by two distinct components: the perceived sacrifice associated with leaving, and the costs resulting from a lack of employment alternatives. These components have consistently been found to be related to one another, but differentially related to other constructs, suggesting that the Allen and Meyer (1990) framework may be defined through four, rather than three, dimensions (Dunham, Grube, & Castañeda, 1994; Hackett, Bycio, & Hausdorf, 1994; Meyer, Allen, & Gellatly, 1990).

Table 2
Study 2: Means, standard deviations and cross-sectional correlations

Variable	Mean T1	SD T1	Mean T2	SD T2	1	2	3	4	5	6	7
1. Autonomous Motivation	2.50	0.91	2.65	0.92		0.63***	0.22*	0.72***	0.57***	.24*	-.20
2. Introjected Regulation	2.41	1.01	2.40	1.04	0.68***		0.29**	0.54***	0.54***	.41**	.05
3. External Regulation	3.22	0.79	3.30	0.91	0.10	0.31**		0.28*	0.21	.34**	.39**
4. Affective Commitment	3.17	0.86	2.91	0.90	0.61***	0.49***	0.15		0.78***	.54**	-.10
5. Normative Commitment	2.50	0.87	2.55	0.84	0.56***	0.56***	0.25*	0.72***		.54**	-.59
6. High Sacrifice	2.74	0.86	2.73	0.84	.37**	.39***	.36**	.485**	.624**		.26*
7. Low Alternatives	2.87	1.12	2.97	1.04	-.27*	.10	.38**	-.07	.11	.35**	

Note. $N = 81$. Correlations for Time 1 are below and for Time 2 above the diagonal. * $p < .05$, ** $p < 0.01$, *** $p < 0.001$

The pattern of results for Time 2 was very similar. Affective commitment was positively related with autonomous motivation. This correlation was significantly higher than the one with external regulation, $t(78) = 4.29, p < .01$, and higher than the one with introjected regulation, $t(78) = 2.65, p < .01$. Therefore, we found full support for H1. Normative commitment was positively related with introjected regulation. This correlation was not significantly higher than the one with autonomous motivation, $t(78) = .39, ns$, but was significantly higher than the one with external regulation, $t(78) = 2.86, p < .01$. Therefore we found partial support for H2. High sacrifice was positively related to external regulation. This correlation was equal to the one with autonomous motivation, $t(78) = 0.76, ns$, and to the one with introjected regulation, $t(78) = 0.58, ns$. Low alternatives was also positively related to external regulation. This correlation was higher than the one with autonomous motivation, $t(78) = 4.77, p < .01$, and to the one with introjected regulation, $t(78) = 2.73, p < .01$. So again, we found support for H3 only for the low alternatives component of continuance commitment.

Table 3 presents cross-lagged analyses using zero-order correlations. Autonomous motivation at Time 1 was positively related to affective commitment measured 6 months later, and affective commitment at Time 1 was equally positively related to autonomous motivation at Time 2. The correlation between affective commitment T2 and autonomous motivation T1 was not significantly higher than the one with introjected regulation T1, $t(78) = .70, ns$, but was significantly higher than the one with external regulation T1, $t(78) = 3.02, p < .01$. The correlation between affective commitment T1 and autonomous motivation T2 was significantly higher than the one with introjected regulation T2, $t(78) = 2.96, p < .01$, and also higher than the one with external regulation T2, $t(78) = 3.34, p < .01$. This offers overall good support for H1. Introjected regulation at Time 1 was positively related to normative commitment at Time 2, and normative commitment at Time 1 was almost equally related to introjected regulation at Time 2. The correlation between normative commitment T2 and introjected regulation T1 was not significantly higher than the one with autonomous motivation T1, $t(78) = .67, ns$, but was higher than the one with external regulation T1, $t(78) = 2.23, p < .05$. The correlation between normative commitment T1 and introjected regulation T2 was not significantly higher than the one with autonomous motivation T2, $t(78) = .98, ns$, but was higher than the one with external regulation T2, $t(78) = 2.30, p < .05$. This partially supports H2.

Table 3
Study 2: Cross-lagged analyses using zero-order correlations

	Autonomous motivation T1	Introjected regulation T1	External regulation T1	Autonomous motivation T2	Introjected regulation T2	External regulation T2
Affective commitment T1				.56***	.32***	.16
Normative commitment T1				.53***	.45***	.17
High Sacrifice commitment T1				.29**	.40***	.28*
Low Alternatives commitment T1				-.27*	.10	.37**
Affective commitment T2	.59***	.54***	.21			
Normative commitment T2	.50***	.55***	.30**			
High Sacrifice T2	.18	.33**	.31**			
Low Alternatives T2	-.17	.02	.30**			

Note. $N = 81$, * $p < .05$, ** $p < .01$, *** $p < .001$

High sacrifice at Time 1 was positively related to external regulation at Time 2, and external regulation at Time 1 was equally related to high sacrifice at Time 2. The correlation between high sacrifice T1 and external regulation T2 was not significantly higher than the one with autonomous motivation T2, $t(78) = 0.07$, *ns*, nor was it with introjected regulation T2, $t(78) = 0.97$, *ns*. The correlation between high sacrifice T2 and external motivation T1 was not significantly higher than the one with autonomous motivation T1, $t(78) = 0.90$, *ns*, nor was it with introjected regulation T1, $t(78) = 0.16$, *ns*. Low alternatives at Time 1 was positively related to external regulation at Time 2, and external regulation at Time 1 was also positively related to low alternatives at Time 2. The correlation between low alternatives T1 and external regulation T2 was significantly higher than the one with autonomous motivation T2, $t(78) = 5.28$, $p < .01$, and the one with introjected regulation T2, $t(78) = 2.14$, $p < .05$. The correlation between low alternatives T2 and external regulation T1 was significantly higher than the one with autonomous motivation T1, $t(78) = 3.31$, $p < .01$, and the one with introjected regulation T1, $t(78) = 2.21$, $p < .05$. Therefore, we found support for H3 only for the low alternatives component of continuance commitment. These results also do not offer complete support for H4; although motivation and commitment were related over time, the relations were as strong in both directions.

To test H4 more stringently, we conducted a cross-lagged analysis through path analysis (Jöreskog, 1979). Like Van Dyck and colleagues (2006), we accepted a significance value of $p < .10$ because of our small sample size. Results are summarised in Figure 2. Autonomous motivation at Time 1 was related to affective commitment at Time 2, whereas the opposite path from affective commitment at T1 to autonomous motivation at Time 2 was not significant, supporting H4. The analysis was repeated with introjected regulation and normative commitment. Introjected regulation was a significant predictor of change in nor-

mative commitment, but normative commitment was not a predictor of change in introjected regulation. Again, this supports H4. The analysis was repeated with external regulation and the two components of continuance commitment (see Figure 3). External regulation was not a significant predictor of change in the high sacrifice component of continuance commitment, just like the opposite was also non-significant. However, the low alternatives component of continuance commitment was a significant predictor of change in external regulation. The opposite was non-significant. Therefore, H4 was not supported for continuance commitment, and even showed the opposite trend for low alternatives.

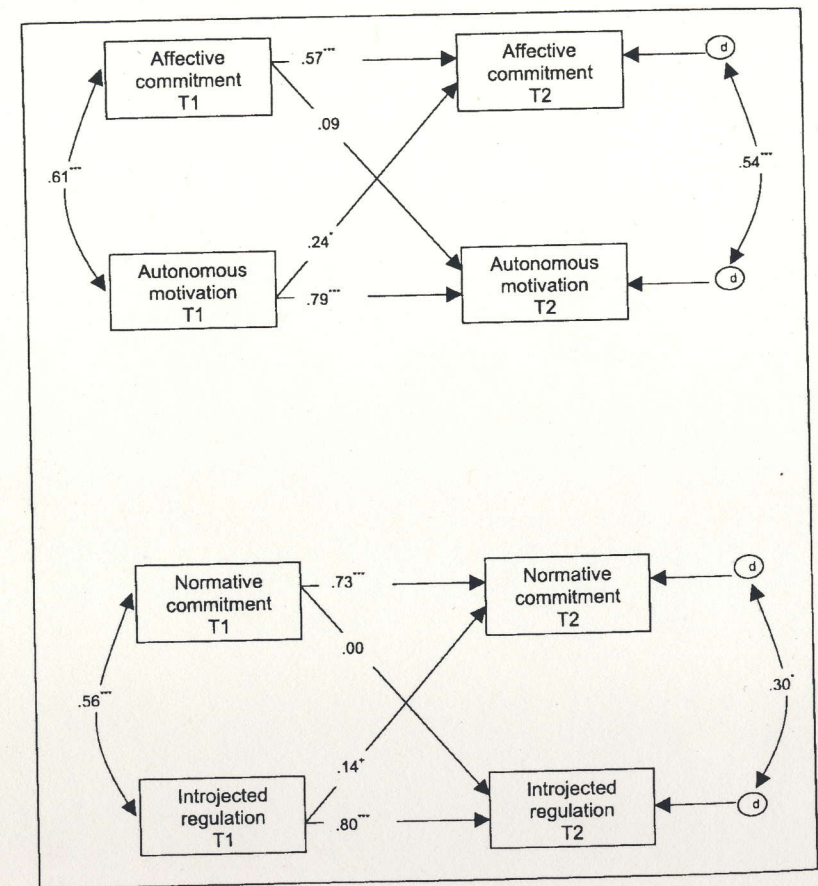


Figure 2

Cross-lagged analyses of the relation of affective and normative commitment to motivation, Study 2

Note. * $p < .10$; ** $p < .05$; *** $p < .001$

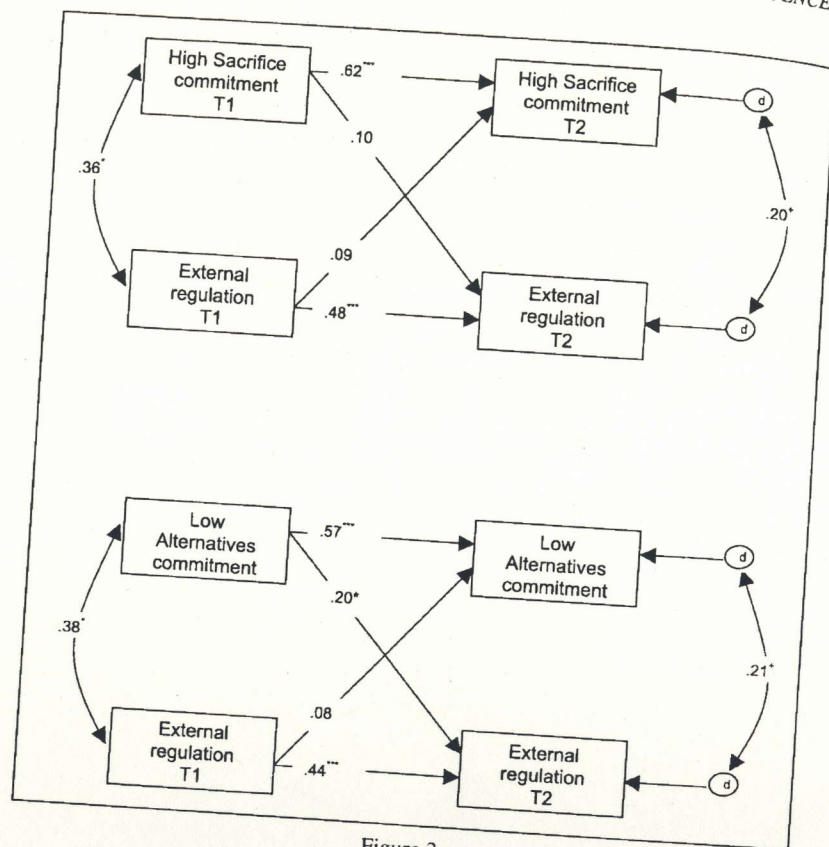


Figure 3
Cross-lagged analyses of the relation of continuance commitment to external regulation, Study 2

Note. + $p < .10$; * $p < .05$; *** $p < .001$

General discussion

We conducted two longitudinal studies to examine the direction of influence between work motivation and organisational commitment. Meyer and colleagues (2004) suggested that commitment would lead to motivation, and that motivation would feed back into organisational commitment through many mediators. In contrast, we proposed that motivation would lead more directly to changes in commitment because of a mechanism of internalisation that is part of the motivational process. Using self-determination theory (Deci & Ryan, 1985) to examine how a continuum of motivation would map

onto Meyer and Allen's (1997) commitment forms, we tested and found that affective commitment is most related to autonomous motivation, and that normative commitment is most related to introjected regulation. We also found that both components of continuance commitment are related to external regulation, but this link was stronger than the other correlations only for low alternatives. High sacrifice was equally related to external and introjected regulation, and to autonomous motivation. Similarly, using O'Reilly and Chatman's (1986) conceptualisation of commitment, we found that integrative commitment is highly related to autonomous motivation. Unfortunately, we could not test the hypothesis that instrumental commitment is positively related to external regulation because of low internal reliability problems with these two measures. Overall, these results provide support for Meyer et al.'s (2004) propositions regarding links between different types of motivation and different forms of commitment. Meyer et al. (2004) proposed that motivation and commitment both follow a continuum reflecting increasing degrees of internalisation. In our studies, motivation accounted for about 10% to 50% of the variance in organisational commitment.

We also found that motivation influences organisational commitment over time, and that commitment rarely influences work motivation over time. In Study 1, autonomous motivation predicted changes in integrative commitment. In Study 2, autonomous motivation predicted changes in affective commitment, and introjected regulation predicted changes in normative commitment. The results were however different for continuance commitment. External regulation did not predict either component of continuance commitment. However, low alternatives predicted changes in external regulation. We do not know why the effect was reversed for low alternatives. It is possible that different forms of commitment develop differently. More internalised forms of commitment may develop through internalisation of motivation. Does high sacrifice involve any level of internalisation? It seems to involve more internalisation than low alternatives, which involves looking "outwards" to see if it is worth staying or not. It may be that the least internalised forms of commitment develop through mechanisms other than motivation, such as economic conditions and self-confidence. We cannot conclude from these two studies with only 2 time points whether this is a replicable finding and if different mechanisms influence affective, normative and continuance commitment, but it does open the door to more detailed tests of these relations.

Nonetheless, we found support for the premise that internalisation is a mechanism through which some forms of organisational commitment can develop and change over time. It also gives preliminary support to the premise that work-related events that have been shown to influence internalisation of work motivation (e.g., managerial support; Baard, Deci, & Ryan,

2004; Deci, Ryan, Gagné, Leone, Usunov, & Kornazheva, 2001; Gagné, Koestner, & Zuckerman, 2000) are likely to influence organisational commitment. It is interesting to note that the present results point to a distinction between the constructs of identified regulation and identification within commitment theories. Confirmatory factor analyses supported a model where these two targets of identification can be distinguished psychometrically. Moreover, if there had been substantial overlap between the two measures, cross-lagged analyses would have been highly significant in both directions. But our results showed an unidirectional effect, which further demonstrates that these constructs are distinct.

In the present studies, we only tested longitudinal effects over 2 time periods, providing only a limited test for reciprocal effects. Although we used path analysis to give us more unequivocal information about these reciprocal effects, future research should use more than two time points to test possible cyclical effects with bigger sample sizes and latent growth modeling. The internal reliability problems in Study 1 for instrumental commitment and external motivation precluded us from adequately testing H3 and H4. Fortunately, we did not have these problems in Study 2 and we were able to test our hypotheses more assuredly. Although we cannot preclude that we may have obtained inflated relations between motivation and commitment due to common method bias, future research could use behavioural indicators of motivation and commitment (e.g., persistence and turnover) to further validate our findings.

Our results provide preliminary evidence that motivational internalisation can explain how employees become committed to their organisation. Although patterns of influence between motivation and commitment did not differ based on tenure in the organisation in our samples, using samples of newcomers will be essential if follow up research wants to examine fully how commitment develops. Future studies should also examine the role of social organisational context in promoting internalisation and commitment. Self-determination theory proposes that contexts that are "autonomy supportive" promote internalisation (Deci et al., 2001; Gagné et al., 2000). Future research should also examine how increases in commitment through internalisation are related to other organisational outcomes, such as absenteeism, turnover intentions, and in-role and extra-role performance-related behaviours. Finally, similar to how Meyer and Herscovitch (2001) have proposed looking at *commitment profiles*, which consists of examining how clusters of forms of commitment can influence outcomes (e.g., Wasti, 2005, Gellatly, Meyer, & Luchak, 2006). Future research could also examine if using motivational profiles would add to the prediction or development of organisational commitment.

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