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Development and Validation of the Multidimensional Turnover Intentions Scale

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Abstract

The purpose of this study is to make available to researchers and practitioners a new instrument to measure turnover intentions based on a compensatory Multidimensional Item Response Theory (MIRT) model. Since extrinsic and intrinsic aspects are measured, item parameters and individual scores are provided for each dimension. The Multidimensional Turnover Intentions Scale (MTIS) was administered to 146 workers of multinational automotive company. Multidimensional Graded Response Model was chosen for item calibration and EAP estimation technique was deployed for producing the individual's factor scores. The two-dimensional structure was confirmed, with all the thirty items properly measuring turnover intentions. Items more likely to predict turnover intentions and an interpretation about individual scoring under a MIRT approach are presented. The MTIS can help companies to work beyond their turnover rates, mainly on the analyses of their talented employees with a stronger intention to leave the organization, and then create new strategies aimed at worker retention.

Introduction

Turnover intentions can be thought of as the conscious will to leave a current organization, which is deemed amongst the most significant challenges companies face (Wen-Rou & Chih-Hao, 2016). Employee turnover, as examined in the past, has a significant impact on different elements of organizational life, such as performance (McEvoy & Cascio, 1987; Trevor, Gerhart, & Boudreau, 1997) and productivity (Huselid, 1995).Thus, turnover directly affects both organizations and individuals.

According to Rizwan et al. (2014), turnover has been considered as one of the most costly and difficult human resource challenge faced globally by different organizations. Costs of turnover vary, and depending on employment sector, they can range from 20% to an

enormous 213% of an employee's annual salary among positions requiring significant level of higher education and training, such as senior executives (Boushey & Glynn, 2012). Crucial sectors like health services (Hogh, Hoel, & Carneiro, 2011; Roche, Duffield, Homer, Buchan, & Dimitrelis, 2015) or education (Adusei, Sarfo, Manukure, & Cudjoe, 2016) also struggle with high costs of turnover rate, which directly affects the quality of services these sectors are expected to provide.

There are two different types of turnover: involuntary and voluntary. Involuntary turnover is less costly since it is planned and takes place through a termination of an employee, typically due to negative performance (Barrick & Mount, 1994),or to the employee's redundancy while the company is downsizing (Morrell, Loan-Clarke, & Wilkinson, 2004). It entails relatively small proportions of an organization's workforce and aims to eliminate low-skilled employees in order to improve organizational indicators (McElroy, Morrow, & Rude, 2001). Conversely, voluntary turnover may relate to any combination of many factors, such as negative relationships between boss and employees (Schwepker Jr., 2001), lack of satisfaction with salary (Sharma, 2016), perpetual loss of motivation leading to burnout, widely known as emotional exhaustion (Kim, 2015), work-life conflict and the need to look after parents and relatives (Sufian, Abdallah, & Diab, 2016), better offer from other organization which concerns salary (Nawaz & Pangil, 2016), opportunities for career growth (Weng & McElroy, 2012) and working conditions (Hanushek & Rivkin, 2007). This is by no means an exhaustive list, but it gives an indication of the many reasons taking place when one decides to leave the organization.

Voluntary turnover is typically more problematic than involuntary as it is difficult to predict, and its outputs can have a huge effect on the organizational effectiveness. Thus, this study is focused on voluntary turnover only, especially on the development and validation of

a multidimensional instrument measuring intrinsic and extrinsic elements that could prompt an individual to leave their current organization.

Theory of turnover

The literature on turnover is divided into three main topics (Ongori, 2007):sources or antecedents of employee turnover, effects or consequences of turnover, and the strategies to avoid or minimize turnover. It is unclear when turnover became a research topic however. (Hom, Lee, Shaw, & Hausknecht, 2017)point out that its roots could be traced back to Bills (1925) publication. In his study, Bills introduces a very basic predictive study design in order to investigate the influence of parental occupation status on turnover. Following his studies, research on turnover began to be shaped by the investigation of motives or reasons for its occurrence. According to Hom, Lee, Shaw, & Hausknecht, 2017, the 1960's and 1970's are the period when job satisfaction and commitment were identified as primary antecedents of turnover.

Prevailing theoretical models for studying turnover and its antecedents are varied. The work of March & Simon (1958) can be described as the first formal theory of turnover, when they figured out job satisfaction as a key factor which could contribute to one leaving a job (Lee, Hom, Eberly, Li, & Mitchell, 2017). Later, Mobley' s model (1977) explained the process by which the employee engages in while deciding to leave an organization. As stated by Mobley, the process starts with an evaluation of the current job, which eventually results in job satisfaction or dissatisfaction. Dissatisfaction leads to thoughts of leaving an organization and drives the individual toward looking look for alternative jobs. If a suitable option is found and the costs of leaving are manageable, the employee resigns and leaves his or her job.

From a different perspective, Price (1977) developed a content-model rather than a process-model to investigate the antecedents of turnover. The author identified in the literature several antecedents of job satisfaction and studied how they could moderate the will

to leave an organization. A later model devised by Price & Mueller (1986) expanded the former Price's model adding external causes (e.g. commitment and kinship responsibility). More recent models on turnover antecedents are the Unfolding Model (Lee & Mitchell, 1994) and the role of Job Embeddedness (Mitchell, Holtom, Lee, Sablynski, & Erez, 2001).

Since data on actual turnover is difficult to collect and oftentimes not accurately or consistently collected (Medina, 2012),the majority of the studies investigate turnover intentions as a proxy for actual employee turnover. According to Tett & Meyer (1993), turnover intention is a conscious and deliberate willfulness to leave the organization which increases the probability that an employee may change their job in the future. Based on this perspective, the current study aims at investigating turnover intentions rather actual employee turnover.

Why a new measure for turnover intentions?

Few instruments have been developed to measure turnover intentions, and most of the items created to study the phenomenon are just part of the investigation of other organizational characteristics, such as organizational commitment, burnout, organizational citizenship behaviour, alienation and performance, not allowing to measure the construct in more depth. Also, the majority does not have its psychometric properties more broadly investigated, missing important information about construct validity and standardization.

Some short scales have been devised, such as Bothma & Roodt (2013) six-item scale, Vigoda (2000) five-item scale, Mitchell, Holtom, Lee, Sablynski, & Erez (2001) three-item scale, Bluedorn (1982) three-item scale, Hom & Griffeth (1991) two-item scale, and Ghosh, Satyawadi, Joshi, & Shadman (2013) one-item scale. Although some of them show findings about test reliability, neither information has been presented regarding test dimensionality nor norms have been developed to score future respondents. Moreover, most studies either adapt or use few items of scales. These items often indirectly measure the construct or were

developed to be used in very specific contexts, furthering highlighting the need for updated approaches to measurement and analysis.

While these scales are popular and easy to use, the development of a more comprehensive and formally validated measurement of turnover intentions is paramount. As such, the Multidimensional Turnover Intentions Scale (MTIS) was developed for investigating extrinsic and intrinsic elements that play a role in the decision to spontaneously leave an organisation. Extrinsic elements are comprised of characteristics present in other organisations that could potentially be perceived as attractive by a worker or by someone else who has a high degree of influence on the worker's behaviour. Extrinsic factors include salary dispersion (Wang, Zhao, & Stewart, 2015) , better working conditions (Ladd, 2011), pressure from family members (Boyar, Maertz Jr., Pearson, & Keough, 2003), better organization's localization (Hitotsuyanagi-Hansel, Forese, & Pak, 2016), and greater work flexibility (Moen, Kelly, & Hill, 2011). Conversely, intrinsic elements are made up of aspects that arise from within the individual. These are based on experiences and perceptions regarding the current organisation, such as feeling discriminated against (Avery, McKay, & Wilson, 2008), being treated unfairly (Dailey & Kirk, 1992), or driven by internal rewards, such as need for professional qualification (Levine, 1993) and a challenging working environment (Markey, Ravenswood, & Webber, 2015).

Despite the separation between external and internal elements, the decision to leave an organisation is typically considered holistic. Hence, even if a worker decides, for instance, that she will be leaving the organisation because the benefits of another organisation are better, her decision will not be solely prompted by the characteristics of the new organisation, since the characteristics of the current organisation will be inevitably compared against. As such, the decision to leave can be deemed a result of the trade-off between what the current organisation has to offer and the potential benefits of working for a new company.

Within such a holistic decision, it is natural that a number of dimensions must be considered and weighted appropriately. To model the item multidimensionality and therefore account for the relationship between locations (latent trait) in a multidimensional space and the probabilities of their responses to a test item (Reckase, 2009), MTIS was developed and validated based on the Multidimensional Item Response Theory (MIRT) approach.

In practical terms, when items are designed under the MIRT perspective, they measure at least two dimensions at once and the individual scores are then calculated for each dimension. While several scales have been validated to measure turnover intentions, the Multidimensional Turnover Intentions Scale is the first instrument designed in order to concurrently provide information about intrinsic and extrinsic elements that influence turnover.

How MIRT can contribute to the science of organizational behavior

Multidimensional Item Response Theory (MIRT) holds significant promise for the development of psychometric instruments into the field of organizational behavior. In a broad sense, MIRT is an extension of Item Response Theory to within-item models, allowing items to belong to more than one dimension at a time. While between-item multidimensional models rely on limited information such as the correlational structure of the multivariate latent response distribution (Wirth & Edwards, 2007) and create independent-cluster structures (McDonald, 2000), within-item multidimensional models take full advantage of the information in the data by modelling multiple abilities as underlying responses to single items (Hartig & Höhler, 2009).

Taking the items of the Multidimensional Turnover Intentions Scale as an example, under the MIRT approach, if one responds that they strongly agree with the statement *"I would move to another organization if it offered me greater flexibility"*, this decision is meant

to be made not only based on what another organization has to offer (external aspects), but on the level of flexibility currently perceived by the worker regarding his current organization (internal aspects). All of the items were therefore designed to reflect both extrinsic and intrinsic factors so that the reasons why one wants to leave the organization could be better determined. Consequently, a respondent with scores $\theta_1 = 1.25$ and $\theta_2 = 0.5$ in the dimensions extrinsic and intrinsic, respectively, could be identified as someone whose external elements seem more enticing than the current characteristics of her organization while deciding whether to leave or stay in an organization.

Depending on how the information from a vector of θ-coordinates is combined with item parameters to specify the probability of responses to an item, MIRT models can be compensatory or noncompensatory (Reckase, 2009). Based on a linear combination of θ-coordinates, compensatory models yield the same sum with different combinations of θ-values. Thus, a low θ-value in one dimension can be compensated by a higher θ-value in another dimension. Conversely, noncompensatory models estimate the probability of responses to an item from the product of the probabilities for each part. The dimensions under investigation are therefore separated so a unidimensional model can be used for each part. As this study assumes that turnover intentions are the result of a tradeoff between internal and external aspects, and the responses to the items depend on the variation of both θ-coordinate axes, a compensatory MIRT model was then utilized for the investigation of the multidimensionality of the Multidimensional Turnover Intentions Scale.

Method

Participants

Data were collected in a global automotive company with headquarters in Europe. Due to its diverse business strategy, the company has expanded to 49 different countries and has

currently around 212,000 employees in total. Its maximum revenue was reached at 39.2 billion euros in 2015, positioning it as one of the largest automotive companies in the world.

The link with the questionnaire was randomly sent to participants across the company branches through their corporate email. Consent was required prior to accessing to the full survey. All answers were collected anonymously, with no records of name or any other form of identification. This was done in order to develop trust intended to elicit reliable and candid responses. In total, 146 workers (52.7% male) agreed to participate in this study, with 74.0% of the total sample born after 1980, here considered as Generation Y. The other part of the answers came from employees born before the year of 1979, the majority in the late 1970's, which can be considered as a transition period from the Generation X to Generation Y. When asked about their marital status, 55.4% of the participants were either married or cohabiting and 40.1% were single. Fifty two percent received university-level degrees, with 39.7% receiving postgraduate qualifications. The 39.7% is separate from the 52.0%. When questioned if they were financially responsible for their current household, 76.0% of the participants were responsible for at least half of their household spending; 23.0% were financially responsible for either nothing or contributed only with a minor part of their household spending.

With regard to their current position in the organization, 35.7% of the participants are in leadership posts, either leading people or leading a whole department (e.g. leading a sales office). In order to identify where the participants came from, they were grouped into four major blocks. The "Americas" block accounted for by 43.1% of the participants, followed by the "Asia" (29.4%) and "Europe" blocks (22.6%). Due to fewer branches, only 4.8% of respondents were based in the "Africa" block.

Instruments

The Multidimensional Turnover Intentions Scale (MTIS) was designed with 30 items on a 6-point Likert-scale, ranging from 1 (totally disagree) to 6 (totally agree) measuring two dimensions. The items comprising the first dimension were based on seven out of the eight forces and motivational mechanisms proposed by Maertz & Griffeth (2004): affective, calculative, contractual, behavioral, alternative, moral/ethical and constituent forces. According to these authors, turnover intentions are psychological forces that trigger conscious deliberations about organisational membership; they may be responsible to ultimately drive decisions about whether to stay or leave an organisation. Since these forces and motivational mechanisms are mental behaviors, which are primarily intrinsic to the individual, this dimension was called *intrinsic dimension*. Additionally, some items were developed so as to measure characteristics present in other companies that could be potentially attractive to an employee, as well as perceived expectations about salient others outside the organisation that could influence the decision of either staying or quitting, including the normative force devised by Maertz and Griffeth (2004). As these items describe a motivation arising from outside the individual, this dimension was called *extrinsic dimension*.

In order to force the respondent to pick an option on either the lower or higher end of the rating scale and then avoid neutral responses, a even number of categories was chosen. All items were created under the same statement *"I would move to another organization if..."*, and aimed at covering a wide range of intrinsic and extrinsic characteristics as aforementioned. While developing the MTIS items, recommendations from Reckase (2009) were followed so that multidimensional items could be delivered. For instance, consider this item: *I would move to another company if the benefits were better than the ones provided by the organization where I work today*. The decision ultimately rests on the comparison between the incoming offer and the employee's perception of benefits currently received, yet

the extrinsic factors are still a major influence. To complement MTIS, sociodemographic items were used to further study personal and professional characteristics.

Data Collection

Participants were introduced to the instrument by means of the digital platform GoogleDocs and invitations were sent through the company's corporate email. An Informed Consent Statement was initially administered in order to let the participants know the ethical aspects involved in this investigation, as well as the confidentiality concerning the processing and storing of the data provided.

Data Analysis

Before proceeding with the data analysis, the items 7, 12, 19, 21, 23, 24, 25, 27, 29 and 30 were reversed scored. After that, construct validity of MTIS was assessed according to a MIRT model, as introduced before. As such, the probability of an individual with a given latent trait (θ) response to an item is a function describing the relationship between the item parameters and the characteristics of a person. As it is expected to have more than one latent trait assessed (intrinsic and extrinsic), at least two θ-coordinates are expected to represent the person's characteristics. Similar to the z-scores scale, the θ-coordinates can theoretically vary from $-\infty$ to $+\infty$, but they typically range from -3 to +3. In order to finally decide over the appropriate number of dimensions, parallel analysis and statistical comparisons of model fit (Akaike information criterion and Bayesian information criterion) were computed.

For the purpose of this research, a MIRT compensatory model was utilized since the response to an item cannot be considered as independent from the dimensions under investigation. Thus, the linear combination of θ-coordinates measuring intrinsic and extrinsic aspects could yield the same sum irrespective of which θ-coordinate is high or low.
The Multidimensional Graded Response Model (MGRM) was computed to estimate the MTIS item parameters. This model assumes that the probability of responding to a specific

category should increase monotonically with an increase in any of the dimensions underlying the scale. Full information maximum likelihood (FIML) with an expectation-maximization (EM) algorithm was performed for the estimation of the MGRM. When applied to multidimensional models, FIML will also calculate a factor analysis matrix, though its interpretation is primarily different than the one computed built on methods of limited information. Cross-loadings, instead of being synonymous with ambiguous information, will represent the dimensions assessed, regardless of the total number of cross-loadings. Considerations about the theoretical meaning of the cross-loadings must be taken into account though (Gorsuch, 1983; Smith & McCarthy, 1995)Apart from that, absolute values of factor loadings are expected to be greater than or equal to 0.32 (Tabachnik & Fidell, 2013), just as it happens with Classical Test Theory (CTT).

As stated by the MGRM, two discrimination (α) parameters were calculated, one for each dimension measured. Also, in order to test the overall level of discrimination for each item, a value analogous to the discrimination parameter from the UIRT model was computed. This parameter is called multidimensional discrimination (MDISC). Although the discrimination parameter can theoretically vary from $-\infty$ to $+\infty$, it is expected that its values lie within the range 0.8 to 2.5 (De Ayala, 2013). In the same way, two separate factor scores were computed for each individual, one representing his level on intrinsic dimension and the other, on the extrinsic dimension. In order to facilitate the interpretation of the multidimensional-based model, nine dyads covering potential combinations between the discrimination parameters for the Extrinsic and Intrinsic were created (Table 1). As a rule of thumb, the higher the positive discrimination parameter, the more rapidly the probability of leaving an organization increases. Conversely, the higher the negative discrimination parameter, the more rapidly the probability of remaining in the organization increases.

Insert Table 1 HERE

Combination 1 is that one expected to contribute a faster growth in the probability of leaving an organization since not only the perception of aspects from another company will play a role in the decision of quitting, but the elements of the current organization are also contributing toward the turnover intentions. For those items whose slopes fit into Combinations 2 and 3, the decision-making process is due to be more balanced since the external elements are leaning toward leaving, whereas the internal aspects tend toward staying (Combination 2), or vice-versa (Combination 3). In contrast with Combination 1, those agreeing with items under Combination 4 are expected to achieve the faster rate of change toward the probability of remaining as both the intrinsic and extrinsic elements presented are not considered as having substantial weight in their decision to leave. Combinations 5 to 8 are characteristic of pure unidimensional items, having positive or negative slopes in either of the dimensions. Finally, combination 9 is the case where the information provided by an item is irrelevant for both dimensions and the psychometric properties of the item cannot be considered as attractive to keep the item in the instrument. This is the primary case in which an item should not be taken for further consideration, but excluded from the instrument accordingly, in view of better estimating individual factor scores.

The scalar d_{ik}, representing how difficult a person will reach the k_{th} step of the item, is scaled onto the same continuum as the θ-vector scale. It is worth noting however that the d_{ik} has an inverse relationship with the scores for the item. As such, high positive values amount to relatively easier scores, whereas large negative values represent scores more difficult to obtain (Reckase, 2009). Applied to MTIS, high positive d_{ik} values is evidence that the content underlying the turnover intention item is more likely to be agreed upon by the respondents, demonstrating therefore higher intentions to leave an organization. On the other hand, the lower the d_{ik} values, the less likely is the worker to quit an organization.

Cronbach's alpha was computed in order to investigate the scale reliability for each dimension. For the standardization of MTIS, factor scores (thetas) were finally estimated through EAP and converted into percentiles.

Results

MIRT analysis

The results of parallel analysis showed that either two or three factors could account for the dimensionality of MTIS. Accordingly, the MIRT models with two and three factors were tested. Although the three-dimensional model (AIC=12722.92; BIC=13346.49) has a slightly better fit than the two-dimensional (AIC=13110.42; BIC=13647.47), the items that loaded onto the third dimension seem to have been randomly clustered since there is no theoretical reason or any pattern that could be identified underlying the content of those items. Also, as the AICc, AIC with a correction for finite sample sizes and more control over overfitting, showed that the two-dimensional model (AICc=11248.71) performed better than three-dimensional model (AICc=11351.36), the third dimension was eventually considered as nuisance and was not considered for further analysis.

The results of the Full Information Factor Analysis for the two-dimensional model showed that all items measure turnover intentions adequately (Table 2). The correlation between the dimensions Intrinsic and Extrinsic was -0.38, showing that turnover intentions vary according to a higher number of enticing aspects coming from another organization combined with a low number of alluring elements from the current organization, or vice-versa.

There are no items with null slopes (Combination 9) or negative slopes (Combination 4) in both dimensions. As can be seen in Table 1, sixteen items loaded primarily onto the extrinsic dimension, followed by 10 items whose factor scores are higher for the intrinsic

dimension. Different from the factor analysis carried out in the context of CTT, where an item is considered ambiguous when a difference between its factor loadings is less than 0.1 (Berkenbosch, et al., 2013), the MIRT approach will regard this event as an important information to be accounted for. As such, four items had high factor loadings in two dimensions, though with different signs.

Except for item 23 (Combination 3) and items 9 and 11 (Combination 7), all items from the Extrinsic dimension have Combination type 1, where both dimensions contribute positively toward a high probability of leaving an organization. Items 17 and 18 were those measuring extrinsic aspects which have more influence from intrinsic elements.
Items 4, 22, 26 and 28, whose factor loadings are high in both factors, have Combination type 2 so that the extrinsic aspects count toward the intentions to leave, whereas the internal aspects counterbalance by having negative discriminations.

When intrinsic elements are the main motive for leaving, Combination type 3 is predominant, with the intrinsic factors weighing in favor of turnover intentions and extrinsic elements collaborating with the intention to remain. The only exception to this rule was item 20, where Combination 2 was detected. Also, item 19 had low discrimination for the Intrinsic dimension, but it was kept in the final version of the instrument since it was compensated by a high slope in the Extrinsic dimension.

In respect of multidimensional discrimination (MDISC), all item slopes were greater than or equal to 1.0, endorsing the overall quality of the MTIS items for the measurement of turnover intentions.

The results of the d_{ik} estimated values, which represent how difficult an item response category is to be endorsed, showed that items 18, 17 and 13, respectively, are the most likely to be accepted while extrinsic aspects weigh more in the decision of leaving an organization. When it comes to intrinsic elements, items 27, 30 and 25, respectively, are those which more

easily drive intentions toward leaving an organization. On the other hand, items 3, 14 and 11, respectively, are among those whose extrinsic characteristics are most difficult to attain, followed by items 20, 29 and 19 measuring the Intrinsic dimension. Also, all the four items with cross-loadings are expected to be hardly endorsed by those whose turnover intentions are high.

Regarding internal consistency, the Cronbach's alpha for Extrinsic dimension was 0.91 and for the Intrinsic dimensions, 0.92. After the calibration of item parameters, factor scores were computed for each individual. Taking participant number 5 as an example, if she decided to leave her organization, intrinsic aspects would likely play a major role since she scored 2.16 in the Intrinsic dimension. On the other hand, as she scored -1.82 in the Extrinsic dimension, if she eventually decides to leave, the elements and characteristics of other organizations would likely influence her decision the least.

Insert Table 2 HERE

Factor scores (theta) and their respective percentiles calculated for both the Extrinsic and the Intrinsic dimensions can be seen in Table 3.

Insert Table 3 HERE

Discussion

When classical factor analytic techniques are deployed, contributions of secondary factors are typically disregarded and much of the information deemed as significant for explaining the relationship between different elements that contribute for the decision-making process is lost. Nevertheless, the Multidimensional Item Response Theory approach provides additional information with respect to both the individual, whose scores can be computed for

each dimension, and the items, as their parameters are estimated by testing models of how different factors interact to better explain psychological constructs.

The application of MIRT models to the field of organizational behavior reflects the complexity and multi-determination of the human behavior so that even the test items which have been designed to be unidimensional measure a complex of latent traits rather than a single trait (Reckase, Ackerman, & Carlson, 1988). For this investigation, a compensatory MIRT model was deployed for the validation of the Multidimensional Turnover Intentions Scale (MTIS) and therefore the estimation of individual scores. The two-dimensional factor structure was confirmed, being the interactions between extrinsic elements of other organizations and intrinsic elements of the current organization the major feature leading the individual's turnover intentions.

The findings regarding the MTIS factor structure show that the Extrinsic aspects are those driving the maximum probability of leaving the organization, though most of the items are influenced by internal aspects alike, as expected. Even though the items had been developed to be multidimensional, most of them had low factor loadings in the second factor, yet significant when discrimination parameters are considered.

Regarding the discrimination parameters, three different situations in which positive and negative signs play an important role for the interpretation of a multidimensional model are considered below. These situations consist of the Combinations types 1, 2 and 3, as previously described. Since no items fit into Combination 4, this type will not be addressed.

As this measure produces factor scores for individuals and the available discrimination parameters showed clear value, the weighted items also present an opportunity for organizations to identify levers that might stem unwanted turnover. As is becoming increasingly popular, personalized interventions that identify individual characteristics and preferences may be considerably more effective than company-wide initiatives to retain

employees. Whether that involves nudges or other behavioral interventions, or incentives tailored to individuals is yet to be determined, but highlighting individual levers offers greater potential for impact.

Taking Item 18 (*I would move to another organization if the benefits were equal to the current organization*) as an example of Combination 1, the decision of leaving an organization due to the general benefits offered are primarily influenced by external aspects, though internal aspects cannot be ignored since its moderate discrimination level shows that internal aspects should also be considered while the final decision is to be made. In the opposite way, the item 24 (*I would move to another organization if I felt discriminated against or excluded within my organization)* reveals that if one feels discriminated or excluded within his or her current organization, chances are high that the reason for quitting will be due to intrinsic aspects, whereas the perception of low discrimination from other organization would further increase the probability of leaving. This is an example of Combination 3. With such insights, interventions may be more effective by using this individual-level measurement rather than general incentive packages or other retention strategies offered to all employees.

The four items with cross-loadings had positive slopes for the Extrinsic dimension, but negative slopes for the Intrinsic dimension (Combination 2). As such, turnover intentions are expected to be positively driven by extrinsic aspects, though the perception of negative intrinsic elements would have a significant influence on the decision of leaving an organization. If a worker, for instance, decides to leave because another organization offered her opportunities to better utilize her knowledge (item 22), the intention to leave is mainly influenced by external circumstances, though the perception that her current company has not drawn upon her knowledge could escalate the turnover intention.

When items are investigated under a compensatory MIRT perspective, it is common that one of the dimensions accounts for a higher variance. Moreover, the higher the discrimination parameters across the different dimensions, the higher the information an item will provide with regard to the trait measured. Notwithstanding, items with discriminations equal or close to zero in one of the dimensions are not desirable when multidimensional items are under investigation and should be ultimately considered as unidimensional. Having an instrument with unidimensional items, yet thought to be multidimensional, does not impinge on the construct validity, but it does not also contribute to identifying the reasons why one wants to leave the organization nor brings further information about specific individual scores for the multiple dimensions. Furthermore, when multidimensional discrimination (MDISC) is taken into consideration, some unidimensional items, such as Item 9, have a total MDISC greater than for some multidimensional items, such as Item 15, since the slopes in both dimensions are not high. While these items still provide information about the trait measured, this is a partial and therefore limited information since only one dimension has actually been measured.

Practical implications

Given the purpose of the measure, the inferences from the analytical method, and the universally relevant nature of turnover in organizations, there are substantial practical implications from our approach and findings. First, this is not merely a tool for scientific study, but one that (at a minimum) HR professionals may utilize in providing senior management with precise insights about both the volume and nature of potential staffing challenges. While some organizations do offer to tailor incentive packages, many retention efforts focus on a corporate mindset, as opposed to bespoke plans targeting those issues

specifically identified. Generalized approaches offer some benefit, but may otherwise miss out on opportunities for retention by lacking that precision. Having this information also allows managers to assess cost-effectiveness of retention strategies, as well as relevant timelines. For example, if it becomes clear that a common reason for potential employee departure is based on the lack of skills training, management may assess the return on investment for providing such opportunities and compare against the cost of losing those employees. They may also assess better the timeline at which this concern may arise based on how long employees are in the organization, plus monitor changes over time and employment variations.

Limitations

In spite of the contributions brought by this investigation, some limitations must be highlighted. First of all, a higher number of respondents was initially expected since this research was conducted across countries in four different continents. However, as the HR's branch was responsible for the data collection, we believe that many workers did not agree to participate and then fill out a questionnaire, fearing their responses about a sensitive topic could be identified and therefore used in the interests of the organization. Although an informed consent had advised them otherwise, the response rate was ultimately affected, jeopardizing the total sample size and its diversification.

A second limitation refers to the nature of the data collected. Since turnover data was not accessible, this study focused on turnover intentions rather than the prediction of actual labour turnover. Further investigation comparing turnover intentions and actual turnover could strengthen the MTIS concurrent validity. The final concerns the age group. The vast majority of participants are from Generation Y or between the end of Generation X and beginning of Generation Y. As such, the norms calculated for MTIS are not recommended to

be used as standards for the interpretation of turnover intentions among Baby Boomers or among those who were born in the first years of 1970's.

Conclusions

This study intended to widen the understanding of the construct turnover intentions by devising an international scale based on the Multidimensional Item Response Theory perspective. Despite MIRT models have received little attention from organizational researchers, their potential to explain complex phenomena in organizational settings is enormous. The Multidimensional Turnover Intentions Scale can help companies to work beyond their turnover rates, mainly on the analyses of their talented employees with a stronger intention to leave the organization, and then create new measures aimed at worker retention. Moreover, the validation and standardization of MTIS may provide insights into the field of organizational behavior and further contribute to the development of this topic and its measurement. When established, this may then be useful in identifying potential levers for improving retention by tailoring to the needs of employees, benefitting both organizations and the individuals who make them function.

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Tables and Figures

Table 1. Combinations between the discrimination parameters for Extrinsic and Intrinsic dimensions

	Combination (type)	Extrinsic (α)	Intrinsic (α)
Multidimensional	**1**	+	+
	2	+	-
	3	-	+
	4	-	-
Unidimensional	**5**	**NULL**	+
	6	**NULL**	-
	7	+	**NULL**
	8	-	**NULL**
	9	**NULL**	**NULL**

Table 2. Psychometric properties of the Multidimensional Turnover Intentions Scale

	Extrinsic	Intrinsic	Extrinsic	Intrinsic	Unidimensional			Category
ITEM	**F1**	**F2**	**a1**	**a2**	**MDISC**	**d1**	**d2**	
I.1	0.51	0.02	0.95	0.29	1.00	3.35	1.61	-0
I.2	0.52	-0.07	1.11	0.16	1.12	3.78	1.91	0
I.3	0.73	-0.13	2.21	0.24	2.22	2.44	0.57	-2
I.5	0.59	-0.08	1.33	0.19	1.35	2.97	1.53	-0
I.6	0.68	-0.04	1.60	0.35	1.64	2.12	0.54	-0
I.8	0.50	-0.06	1.04	0.17	1.05	2.95	1.29	0
I.9	0.56	-0.18	1.44	0.00	1.44	3.00	1.09	-0
I.10	0.59	0.13	1.01	0.52	1.14	3.81	2.43	1
I.11	0.61	-0.19	1.68	0.01	1.68	1.92	-0.22	-1
I.13	0.74	0.07	1.63	0.60	1.74	4.20	2.41	0
I.14	0.79	0.02	2.07	0.60	2.15	3.14	1.20	-0
I.15	0.55	0.19	0.82	0.58	1.00	3.95	2.62	1
I.16	0.68	0.01	1.50	0.42	1.56	4.03	2.21	0

I.17	0.68	0.16	1.24	0.68	1.41	5.07	2.99	1
I.18	0.76	0.16	1.56	0.79	1.74	5.47	2.40	0
I.23	-0.41	0.19	-1.00	0.09	1.01	2.91	1.25	-0
I.4	0.47	-0.46	1.94	-0.65	2.04	1.45	-0.84	-2
I.22	0.48	-0.46	2.02	-0.66	2.13	2.67	-0.14	-2
I.26	0.47	-0.44	1.84	-0.59	1.93	2.46	0.60	-1
I.28	0.48	-0.48	2.10	-0.72	2.22	2.31	0.39	-2
I.7	0.00	0.52	-0.63	0.83	1.04	2.94	1.90	1
I.12	-0.21	0.64	-1.51	1.16	1.91	5.72	2.50	1
I.19	-0.27	0.39	-1.01	0.48	1.12	2.09	0.90	0
I.20	0.25	-0.66	1.77	-1.28	2.18	3.00	0.33	-1
I.21	-0.09	0.67	-1.19	1.23	1.71	3.68	1.93	1
I.24	0.28	0.86	-0.70	2.15	2.26	4.45	2.99	1
I.25	0.16	0.89	-1.19	2.37	2.66	6.35	3.70	2
I.27	-0.10	0.77	-1.64	1.74	2.39	7.15	4.43	2
I.29	-0.09	0.71	-1.32	1.38	1.91	4.89	2.96	1

I.30	-0.03	0.86	-1.95	2.39	3.08	6.98	4.56	2

F1: factor loadings dimension Extrinsic; F2: factor loadings dimension Intrinsic; a1: multidimensional discrimina

multidimensional discrimination dimension intrinsic; a: unidimensional discrimination; d1 to d5: difficult parame

representing $a\theta - ab$.

Table 3. Norms for the Extrinsic and the Intrinsic dimensions

Percentile	Extrinsic thetas	Intrinsic thetas
1%	-4.45	-2.67
5%	-1.94	-2.12
10%	-1.56	-1.73
15%	-1.21	-1.34
20%	-0.98	-1.13
25%	-0.81	-0.88
30%	-0.56	-0.68
35%	-0.45	-0.53
40%	-0.39	-0.37
45%	-0.23	-0.16
50%	0.03	0.02
55%	0.27	0.16
60%	0.47	0.28
65%	0.63	0.48
70%	0.79	0.77
75%	1.00	0.90
80%	1.18	1.06
85%	1.44	1.22
90%	1.58	1.60
95%	1.99	2.66
99%	2.88	3.29
100%	3.07	5.30

Appendix

Multidimensional Turnover Intentions Scale

Below are listed several conditions that could influence your decision to leave your current organization. Rate how much you agree with the action presented, according to the scale below:

Disagree			Agree		
1	**2**	**3**	**4**	**5**	**6**
Totally Disagree	Strongly Disagree	Somewhat Disagree	Somewhat Agree	Strongly Agree	Totally Agree

	I would move to another company if:	
1	It were from the same branch of the company I work for.	
2	It were significantly larger than my current organization.	
3	It made me a better job offer, even if I were not looking for new opportunities.	
4	It owned a higher career advancement plan than my current organization.	
5	It held a higher social status than that of my organization.	
6	It offered a salary higher than my current salary, even being a smaller organization than mine.	
7	I were unhappy with different aspects of my current organization (team, leadership, working conditions, etc.), even aware that my salary would be lower at this other company.	
8	I were offered a salary substantially greater than the one I receive today, even though I was close to retiring from my current organization.	

9	I were offered a new job with better working conditions, even being recently hired by my current organization.	
10	It were closer to my house than my current organization, even if this resulted in a loss of benefits and/or sacrifices in my working conditions.	
11	It offered me more financial and/or employment stability.	
12	My current organization had not made large investments in my professional qualification.	
13	I could maintain the same professional position that I occupy in the current organization.	
14	I could use the knowledge that I have today.	
15	My friends and/or family encouraged me to do so.	
16	It would not make me feel like I have wasted the investment of my current organization.	
17	It were not necessary for me to have to adapt to a new role.	
18	The benefits were equal to the current organization.	
19	I were already thinking of leaving my current job.	
20	I liked the activities that I would perform in the other company most.	
21	The relationship with my work team were not good.	
22	It offered opportunities so I could better utilize my knowledge.	
23	I could not endure my current workload.	
24	I felt discriminated against or excluded within my organization.	
25	My current organization would not offer conditions for career growth.	
26	The benefits were better than the ones provided by the organization where I work today.	

27	My organization were not recognizing my work effort.	
28	It offered me greater flexibility.	
29	I would not feel challenged in my current job.	
30	I were not treated as a "professional" by my current organization.	