

Unweaving leaving: the use of models in the management of employee turnover.

Abstract

The following paper offers a review of the literature on labour turnover in organizations. Initially the importance of the subject area is established, as analyses of turnover are outlined and critiqued. This leads to a discussion of the various ways in which turnover and its consequences are measured. The potentially critical impact of turnover behaviour on organizational effectiveness is presented as justification for the need to model turnover, as a precursor to prediction and prevention. Key models from the literature of labour turnover are presented and critiqued.

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Introduction

In this paper we present an overview of the literature on labour turnover. We begin by outlining the justification for continuing research into turnover, and discuss the key themes of meaning, measurement and prediction, relating these to the organizational goal of effective management of turnover. We argue that despite contextual, relational and epistemological complexities surrounding the phenomenon, the economic and psychological dimensions to turnover, as well as its organizational significance, justify the use of models in turnover research. A dichotomy is introduced between two traditions of turnover research: the labour market school, and the psychological school. A critique of the labour market account of turnover is offered, and then four key models from within the psychological school are presented and critiqued. We conclude that the inability of both schools of turnover research to explain and predict turnover adequately restricts the scope for organizations to manage turnover effectively, and that there is a need for new theory.

A priori justification for turnover research

Any business needs a source of labour to function. This axiom applies equally whether we rely solely on a basic economical model of the firm, with labour as one of the four factors of production (Bannock, Baxter and Davis 1988), or a Marxist account, which emphasises ‘labour power’ (Marx 1867 / 1946: 169), or subscribe to more complex models of organizations, which place importance on intellectual or ‘human’ capital and the importance of knowledge management (Harrison 1999: 409-412). To establish the need to manage resourcing, we do not need to refer to any given context, it follows a

priori from any view of an organization. Even if organizations of the future have ‘virtual’ employees, they will need to manage them as a resource. When an employee leaves, this can have a variety of effects that not only impact on the organization, but also the individual employee and wider society (Mobley 1982: 15-31). These can be positive or negative (Mobley 1982; Hom and Griffeth 1995: 13-33), and a greater understanding of the process of labour turnover can increase the degree to which organizations and employees within organizations can influence these effects (Dalton, Krackhardt and Porter 1981; Dalton, Todor and Krackhardt 1982).

A posteriori justification for turnover research

In addition to the management of resourcing being an a priori concern, there is a posteriori justification for studying this phenomenon. Current explanations of employee turnover fail to offer either predictive or explanatory power (Aquino, Griffeth, Allen and Hom 1997). Despite an enormous literature on turnover in organizations (Price 1977; Mobley 1982), there is as yet no universally accepted account or framework for why people choose to leave (Lee and Mitchell 1994). This prohibits understanding the phenomenon after the event, yet neither is there an accepted means of assessing the likelihood of an individual’s deciding to leave in the future (Terborg and Lee 1984), which prohibits prediction of turnover.

Meaning

Voluntariness

We use 'turnover' to mean '*voluntary cessation of membership of an organization by an employee of that organization*'. This answers Price's call to make voluntariness explicit, which is important as it is in instances where the employee controls the leaving process that organizations and theorists have an interest in turnover. This definition also refers to 'cessation of membership' (Mobley 1982: 10), but it should be acknowledged that from a more institutional or organizational perspective, turnover may also include accession or entry. The scope that a voluntary / involuntary dichotomy offers for classifying the phenomenon enables directed, systematic research (Price 1977). Particularly where turnover is thought to be associated with a factor (such as organizational commitment), or to be preceded by a psychological state (such as intent to quit), drawing the distinction between voluntary and involuntary turnover is important, otherwise assessment of such a relationship in terms of all 'organization leavers' will be flawed.

Involuntary turnover may occur for reasons which are independent of the affected employee(s), such as the (real or perceived) need to cut costs, restructure or downsize. Inclusion of these cases in a study of 'organization leavers', will mean any relationship between turnover and a personal characteristic will be significantly diluted. Even where involuntary turnover occurs for reasons associated with an individual employee (such as poor performance), it is likely these cases are more representative of the wider sample of organizational members in relation to the processual dimension of a decision to leave than any sub-sample of organizational leavers would be. Where an instance of turnover is genuinely voluntary, this instance represents the exercise of choice and is the result of a decision process. To this degree, the set of instances of involuntary turnover (where employees have been forced to leave) is likely to be more representative of the totality of

organizational members than the set of instances of voluntary turnover (where employees have chosen to leave).

To the extent that turnover involves leaving, instances of voluntary turnover also represent a purer social phenomenon, as they catalogue where individuals have chosen to terminate a significant relationship. By way of contrast, in involuntary instances, because these are in some sense owned by an abstract entity (the organization), a relational aspect to turnover namely ‘cessation of *membership*’, is lost. Instead other more impersonal considerations such as (remotely defined) utility prevail. In terms of the nature of social science research, study of involuntary turnover is likely to focus on consequential and extrinsic aspects, rather than intrinsic characteristics.

We accept that in reality the apparently straightforward dichotomy between voluntary and involuntary turnover has limitations (Vandenberg and Nelson 1999). For example, records of instances of turnover may misrepresent the extent to which a turnover decision was voluntary. Where exit interviews are conducted, interviewers may not wish to press too hard when questioning an employee, it is also possible that they will not wish to record details that would cast the organization or the employee in a bad light (Campion 1991). The employee may have similar motives for being reticent about their reasons for leaving, and added to this they may have concerns about the extent to which full and frank disclosure could harm their prospects of receiving a favourable reference. All of these factors may muddy the putatively categorical voluntary / involuntary distinction. In 1969, Samuel called for organizations to have in place their own definitions of turnover and voluntariness in order to help them plan resource-related issues.

Avoidability

It can be seen that in addition to the a priori structural signifiers of the critical nature of turnover, the content of the phenomenon itself is also of interest and it is also important to consider the extent to which an instance of voluntary turnover may be classified as 'avoidable' (Abelson 1987; Campion 1991). In other words, is it a case of employee instigated turnover which could have been prevented. This classification is useful per se, as it can indicate the global scope for future planned intervention. For example, where an organization is able to identify that the bulk of voluntary turnover is beyond their control e.g. where voluntary turnover is a result of relocation by a spouse or partner, they may profit better from initiatives which seek to manage turnover post hoc, rather than spend on theorised preventative measures (e.g. increasing salary levels).

It is important to emphasise that the degree to which it is actually possible for organizations or managers to influence turnover should be assessed alongside any measures of turnover, such as functionality (below). If all instances of turnover appear to be unavoidable, this could redirect the focus of resource spending, so that managers look to minimise the disruption and inconvenience of an inevitable phenomenon (a control model). If however each instance of turnover appears to be avoidable this offers the potential for directed intervention (a prevention model). Although such a pure split is unlikely, the need to assess avoidability would be to prevent situations where managers assume the problem to be predominantly of one type, when it is the other. If managers assume turnover is an inevitable fact of organizational life (but really in their particular context it is largely 'avoidable'), they may fail to recognise instances of turnover as symptomatic of underlying problems. Additionally the associated costs of turnover may

be needlessly tolerated, whereas an element of prevention could save far more.

Conversely, where organizations see turnover as something which they should control (but really in their particular context it is largely 'unavoidable'), they may instigate needless (potentially harmful) change and spend resources on futile 'prevention' measures. This is illustrated below.

'Avoidability' Matrix

(Figure 1 here)

Measurement

Turnover is often not measured in a sophisticated enough manner to enable discrimination between cases where employees have chosen to leave, and cases where they have had to leave for reasons out of their control. Often organizations use a relatively crude measure of turnover such as below: (Marchington and Wilkinson 1997: 97)

$$\frac{\text{Leavers in year}}{\text{Average Number of staff in post during year}} \times 100$$

This does not distinguish the cases where people left because they were dissatisfied, from cases where people left because of ill health or where they retired, or where they were made redundant. Yet measurement of turnover needs to be sophisticated enough to enable those responsible for resource planning to identify various categories of leavers (Worthington 1992: 278; Forbes and McGill 1985: 11-12). This is because any single-figure measure of turnover will be inadequate in so far as it treats all those who leave as an homogenous group.

Although a relatively clear cut behaviour (Porter and Steers 1973), and one which apparently readily lends itself to simple cumulative measurement, attempts to meaningfully record the incidents of turnover can result in ambiguity. Yet the need for organizations to measure employee turnover is substantive (Campion 1991). Turnover is an index of organizational effectiveness (Vandenberg and Nelson 1999), and as such it

warrants attention and some understanding per se. Additionally, however information on turnover can help the planning, prediction, and control of resourcing (Marchington and Wilkinson 1996: 96-100). Furthermore, if we consider the notion that the goal for organizations is to manage turnover effectively, we clearly need to move beyond even this traditional 'Fayol-type' framework. A table outlining progressively sophisticated measurement schema is shown below. This generic table gives a shorthand heuristic for diagnosing existing turnover measures within an organization, though it could also be used to develop strategies for managing turnover alongside broader HRM or business strategy. More generally, it could be used to frame a broad-brush picture of the management of turnover within a particular industry.

Three Levels of Measurement

(Figure 2 here)

Whereas abstract models of 'turnover rates' influencing 'staffing levels' or 'headcount' may provide organizations with sufficient numbers (an efficiency measure), the potential of a more comprehensive understanding of turnover within organizations lies in the ability to manage turnover effectively. However, there are problems implicit in gaining such an understanding. Even setting aside the notion of voluntariness, confusion can still surround the determinants of decision to quit or 'reasons' (Campion 1991) and other relationally defined aspects such as avoidability (Abelson 1987). It should be noted that even from a non-relational perspective measurement is problematic. To illustrate, if we rely on turnover rates then we may avoid the epistemic complexities inherent in assessing bi-partite constructs such as 'avoidability'. However, although there is evidence that rates

of turnover correlate with aggregate data such as underlying labour market trends, or base rates for turnover in organizations, these offer little to the organization or manager seeking to improve turnover in a particular department, or to retain selected staff (Terborg and Lee 1984; Hulin, Roznowski and Hachiya 1985). This severely limits the utility of such aggregated measures as they fail to offer information in sufficient detail to manage turnover effectively. Apart from the lack of detail which such aggregated measures provide, care should also be taken as to the choice of unit of analysis in the measurement and study of turnover to avoid the possibility of committing the ecological fallacy (Terborg and Lee 1984: 808).

Functionality

In addition to these epistemological considerations, care over the choice of unit of analysis is warranted given the considerable empirical and theoretical support for the need to differentiate between types of leavers, in terms of their productivity and the extent to which they are an asset to the organization (Dalton et al. 1982). Again, this illustrates that aggregated measures alone are of limited use. Turnover may have organizational benefits as well as negative effects (Mobley 1982: 22-26), and this means a blanket reduction in the level of employee turnover (an efficiency measure) may only offer part of a solution, which overlooks the potential for turnover to be functional as well as dysfunctional. Management of turnover may have the greatest organizational benefit (an effectiveness measure) where it is targeted at encouraging the retention of valued employees, or where the opportunity for change in personnel is capitalised upon, and ineffective employees can be replaced with more effective employees (Price 1977: 113). The first part of this ‘functionality equation’ describes preventing organizationally dysfunctional turnover (by

keeping productive employees), and the second half describes engendering organizationally functional turnover (by replacing unproductive employees with productive ones). Awareness of the potential functionality of instances of employee turnover is no more than awareness that such change brings with it the opportunity to recruit more productive employees, or to reorganise current work practices.

It is also worth noting that the distinction between functional and dysfunctional leavers may be absolutely spurious, or illusory in instances when turnover is already an acute problem. In this instance developing targeted retention initiatives will not be as much of a priority as the need to control aggregate levels of turnover until there is an element of workforce consistency, or sufficient labour power. Coping with high levels of turnover can rob managers of the time and space necessary to plan.

Prediction

Labour turnover also attracts interest given that instances of turnover are the result of *decisions* to leave. These decisions are often characterised as momentous (Sheridan and Abelson 1983), representing a defining point in a person's career and life history (Krau 1981). Some theorists have challenged this assumption, pointing to decisions to turnover which are governed by non-work considerations (Cohen 1999: 61), or are impulsive (Mobley 1977), or to employees who have a more casual attitude to employment (Hulin et al. 1985; Lee and Mitchell 1994). The evolutionary dimension of these decisions, that is to say the extent to which it makes sense to think of the decision to leave as being the end part of a process, has encouraged research from organizational theorists because of the apparent opportunity it provides to identify determinants or precipitators of turnover, thus offering potential to predict and perhaps then control employee turnover. One potential outcome of such predictor based research could be the identification of traits or characteristics which influence the likelihood of future decisions to quit. This would offer benefits in terms of the element of predictive power. If this were possible, and if valid, reliable measures for these characteristics could be used by organizations, then employee resourcing could be greatly simplified, as identification of these characteristics could influence selection criteria and create a virtuous resource circle.

However, the phenomenon has not so far proved amenable to prediction. Although some research has focused on potential predictors of turnover behaviour, such as job tenure (Taylor, Audia and Gupta 1996), locus of control (Renn and Vandenberg 1991) and demographic correlates (Pettman 1975), bivariate accounts (Clark-Rayner and Harcourt 2000) have proved insufficiently complex to capture the phenomenon, although many

models posit a relationship between an affective disposition or variable such as satisfaction and turnover, with turnover preceded by intentional variables such as ‘intent to leave’, or ‘withdrawal cognitions’. The bulk of turnover models rely on assessment of the moderating or predictive role of any of a vast number of competing variables, (for comprehensive reviews see Hom and Griffeth 1995; Mobley 1982; Price 1977).

Although in many cases these factors have been shown to predict turnover to some degree, there is less of an ability in these theoretical accounts to explain employees’ decisions to quit. Even where some predictive power is evident, it is contentious how useful this can be to organizations seeking to prevent turnover, given that these measures are often most effective the closer to a decision to leave an employee is. In other words, the degree of success with which these measures operate is counterbalanced by the amount of warning they can afford organizations, and also by the limited scope there is to then change an employee’s decision. The likelihood that a simple bivariate correlation will provide a comprehensive theory of turnover precludes the commonsensical notion that employees may leave a job, or organization ‘for a number of reasons’. Although many of the current dominant models of turnover do not rely exclusively on a bivariate correlation, they nonetheless aim to predict turnover via clarification and ordering of the role of antecedent factors, factors which are seen as determined solely by interactions between the employee and their work environment, rather than other ‘external, unexpected or random events’ (Lee and Mitchell 1994), or ‘nonwork domain variables’ (Cohen 1999). These theories fail to describe a large proportion of voluntary turnover decisions, and thus have low ecological validity (Lee and Mitchell 1991).

An additional complication for the measurement – prediction agenda is to do with the utility of any predictions. For a great many ‘predictor’ measures such as satisfaction, commitment, intent to leave etc., the ability of these to predict turnover in individuals is likely to be greater the closer it is to the time an employee decides to quit. If data are gathered shortly before an individual decides to quit, it is likely inferences based on such data will be more reliable. This is not simply a function of there being less intervening time for chance events to influence the process, but a consequence of the ‘cusp’ nature of the turnover decision (Sheridan and Abelson 1983). From an organizational perspective, this can mean that where basis for prediction seems firmer, this indicates the individual is so close to quitting, there is little the organization can do either to influence the decision, or manage the aftermath.

This does not mean that research into potential determinants of turnover is futile however. If we relinquish the goal of a model for measurement – prediction for individual employees, identification of influencing or precipitant factors can help improve management if we see turnover behaviour as one of several forms of ‘withdrawal behaviour’ (Hulin et al. 1985). The extent to which interventions to improve or pre-empt job dissatisfaction (for example) can also positively influence absenteeism or lateness, should be of interest to managers and employees alike.

Although one of the implications of a virtuous resource cycle is that organizations are unlikely to ever completely control resourcing, it serves to highlight that improvements in management of turnover may have a generative effect. The corollary of this is that the problems caused by high turnover may be compounded by shortages of labour, or other ‘knock-on’ effects and adverse turnover can lead to a vicious cycle.

The Search for a Model of Employee Turnover

So far, much of the discussion has centred on the contingent aspects of the turnover process. The goal of 'effective management of turnover' dictates that a high level of sophistication, and thereby particularity, needs to be achieved by organizations in order to selectively influence the turnover process. Voluntariness may need to be defined differently for each organization (Samuel 1969) and measurement of turnover may need to be at a level of detail far greater than that currently employed by many organizations (Campion 1991). Additionally, even where problems in costing turnover (Cheng and Brown 1998; Hom 1992) can be resolved, there remain inescapably problematic aspects to determining relationally defined aspects such as avoidability (Abelson 1987) and functionality (Dalton et al. 1982). In the light of these contingent complications, the aim of a comprehensive theory of turnover can seem unrealistic. This aim seems further complicated if an attempt to predict turnover behaviour is our goal, although as Lee and Mowday (1987: 738) point out, "although researchers tend to emphasize prediction as a criterion in judging models, we should not lose sight of the importance of understanding as a goal of scientific enquiry."

The phenomenon of turnover is of interest to organizations and theorists because it is significant (Price 1977), potentially costly (Mobley 1982) and relatively clear cut (Porter and Steers 1973). It also describes the end result of a decision process (Lee and Mitchell 1991). All these characteristics also indicate that the phenomenon is likely to attract interest from 'modellers'.

The Appeal of Modelling Turnover

The phenomenon attracts interest because of its psychological dimension, its organizational significance, and its economic dimension and within each of the related disciplines of psychology, organizational behaviour and economics there are well established traditions of using models in research and dissemination of theory.

A related legitimating factor is that there is a rich body of research into turnover which routinely uses models. Even where there is debate as to the validity of a particular account of turnover, it is seldom the case that the underlying methodology is called into question. Instead, research is often directed toward refining or clarifying interrelations between established constructs such as job satisfaction, withdrawal cognitions, intent to leave etc. To this extent, the presence of a well established paradigm (March and Simon's 'equilibrium' account) may have hindered research (Lee, Mitchell, Wise and Fireman 1996), restricting development to incremental or insignificant change (Aquino et al. 1997).

All these aspects explain the attractions of using models in turnover research. However, the contextual, relational and epistemological complexities surrounding the phenomenon present a challenge which makes such modelling far from straightforward. The discussion so far has simultaneously stressed the significance and elusiveness of such key concepts as voluntariness, avoidability, and functionality. Each of these is important in considering the effective management of turnover, yet assessment of each embraces epistemological and logistical difficulties which seem to threaten the possibility of any comprehensive account of turnover. The inability for any current model to 'fit' empirical

data on turnover perfectly, implies that no such account has yet been found. That this may be due to the inherent complexity of social phenomena (Checkland 1981: 66-71), poses problems for any universal account.

Two Traditions of Turnover Research

It should initially be said that any classification or attempted taxonomy of turnover literature is wont to be arbitrary, given the vast amount of research to date (see reviews in Price 1977; Mobley 1982; Hom and Griffeth 1995), the eclectic nature of management research (Johnson and Gill 1997) and the degree to which there is overlap and dialogue between different 'schools' of turnover research. Additionally, it is important that such classification needs to explicitly recognise its arbitrary nature, to prevent any elements of parochialism which theorists such as Price (1977) and Pettman (1979) suggest has previously hindered research into turnover.

Taking these initial considerations into account, the framework offered here is intended to provide a meaningful differentiation between two dominant perspectives or traditions of turnover research, which we have chosen to call the economic or labour market school and the psychological school. This division provides a way of organising the literature on turnover, and related models or theoretical accounts, but also demarcates a difference in emphasis within each tradition of turnover research.

Summarily speaking the labour market school deals with issues such as labour supply and demand, job search, subjective expected utility and rational economic choice, availability of job opportunities or perceived alternatives, reward and investment or 'sunk' costs. Key studies have included investigation of; perceived alternatives (Griffeth and Hom 1988), alternative opportunities (Gerhart 1990; Hulin et al. 1985), unemployment (Carsten and Spector 1987), labour market opportunities (Kirschenbaum and Mano-Negrin 1999), job search (Bretz, Boudreau and Judge 1994; Laker 1991), performance (Jackofsky 1984;

Jackofsky, Ferris and Breckenridge 1986; McEvoy and Cascio 1987; Martin, Price and Mueller 1981; Zenger 1992), expected utility (Bedeian, Kemery and Pizzolatto 1991), pay satisfaction (Lum, Kervin, Clark, Reid and Sirola 1998), job cost (Rusbult and Farrell 1983).

The psychological school concerns itself with issues principally related to affect, although a significant difference between psychological accounts and economic accounts is that the former place more emphasis on the decision dimension to turnover. Economic or labour market accounts, on the other hand, analyse turnover with more emphasis on the interplay between externally determined variables such as opportunity. Key studies within the psychological school have included investigation of; job satisfaction (Lee 1988; March and Simon 1958; Mobley 1977), organizational commitment (Porter, Steers, Mowday and Boulian 1974), and other forms of commitment (Allen and Meyer 1990; Blau 1989; Chang 1999; Gaertner and Nollen 1989; Lee, Ashford, Walsh and Mowday 1992); job involvement (Blau and Boal 1987; Huselid and Day 1991), career development (Krau 1981), role stress (Kemery, Bedeian, Mossholder and Touliatos 1985), organizational climate (DeCottis and Summers 1987), equity (Aquino et al. 1997), psychological contract (Morrisson and Robinson 1997; Robinson 1996) and professionalism (Bartol 1979; Price and Mueller 1981).

The Labour Market School

According to Bosworth, Dawkins and Stromback (1996: 175), a labour market can be said to exist when:

... buyers and sellers of labour meet or communicate to agree on a price (a wage) at which they are willing to exchange a given volume of labour services.

They then qualify this by saying:

... the employment relationship...is often complex and rarely characterized by the kind of 'spot market' transactions that occur in the case of the market for other kinds of goods.

This initial definition and its understated qualification serve neatly to highlight the intrinsic conceptual advantages of an economic explanation of turnover, and the limitations of unqualified operationalization of such a theory. Lazear (1995: 2), writes that:

The strength of economic theory is that it is rigorous and analytic...But the weakness of economics is that to be rigorous, simplifying assumptions must be made that constrain the analysis and narrow the focus of the researcher.

The advantages of an economic explanation of labour turnover predicated on the idea of a labour market, such as defined above, are that (in the abstract) it is possible to build

theories and models, based on quantifiable variables that are knowable, or directly result from other knowable variables. However this can only be done after some assumptions, or simplifications have been made. Buyers and sellers of labour have to be able to, “...meet or communicate to agree ...”. The significance of this, is that each party needs to be aware of the other, and be aware of their circumstances (requiring labour / seeking employment). This is intuitively problematic, because it should be seen that in complex industrial or post-industrial societies, individuals, (and even institutions) are unlikely to have perfect knowledge of labour market opportunities.

Search Theory

One attempt to account for actors’ imperfect knowledge of the state of the labour market has given rise to a branch of economics known as ‘search theory’ (Bosworth et al.: 35). Within this branch of economics, to account for individuals having imperfect knowledge of labour market variables (number and constitution of actors, volume of work available etc.), Holt and David (1966) developed the notion of individuals using a ‘reservation price’ in their search for employment. This price is defined as being the lowest salary or wage at which a person will consider accepting a job and can be thought of as a short-hand heuristic which people use to decide whether to accept / reject a job offer in the face of little other information from the labour market. Holt and David’s theory conceptualises a ‘reservation price’ as being “endogenously determined”. That is to say it depends on opportunities received from the labour market. This is because search theory deals exclusively with the unemployed, yet as Lazear (1995: 74) points out, “... much worker turnover occurs without an intervening spell of unemployment.”. For the

modelling of voluntary turnover, it is no use restricting analysis to those who are out of work.

Implicit in the economic account of job search is the idea that search generates a series of alternatives, which are then compared in terms of their 'expected utility' (Mobley, Griffeth, Hand and Meglino 1979). Thus, job search is seen as a separate precursor to quitting. Yet there is research to suggest that conceptualising job search as a discrete stage in a process of rational-economic choice is misrepresentative. Bretz et al. (1994: 276) suggest that job search "serves many purposes". It may convince oneself and others of one's self worth, or convince one of the value of staying in one's current position (Blau 1964). Job search may not be a discrete stage in the quitting process, but instead search and quitting may, "...reflect different aspects of a broader construct of expected utility of withdrawal" (Hom and Griffeth 1995: 110).

Carsten and Spector (1987), in a test of Muchinsky and Morrow's (1980) 'multidisciplinary model' have found evidence that the underlying rate of unemployment may affect the relationship between job satisfaction and turnover, suggesting that, "...the economy acts as a releaser, allowing satisfaction to best predict turnover during periods of high economic opportunity (p 374)." Although this lends some support to the theory that opportunity plays a part in determining turnover, overall there is a lack of empirical evidence for the link between perceived employment opportunities and turnover which renders a simplistic account of job search problematic (Griffeth and Hom 1988). Steel and Griffeth (1989) suggest this process may differ in different industries or occupations, and that the relationship between employment opportunity and turnover may be attenuated by the overall or 'base' turnover rate (Steel, Shane and Griffeth 1989).

Kirschenbaum and Weisberg (1994) suggest there may be two stages to job search, a *passive* stage (typified by normal ‘no cost’ exposure to labour market opportunities), then, following the crystallisation of intent to turnover, an *active* stage (typified by investment in search and associated cost). This distinction between passive and active search may be valuable, if we use passive search to describe situations in which employees periodically assess alternative opportunities to establish their own market value, without ever intending to leave. Such ‘no cost’ exposure to opportunity in these cases may actually be of benefit, in terms of negotiating with their current employer, and as a source of satisfaction. Neither benefit depends on a turnover outcome. Yet this refinement does not answer Bretz et al.’s question, as to why, “...currently employed, ‘successful’ people engage in costly (from both personal and organizational perspectives) job search activity (1994: 296)”, nor does it explain the failure of meta-analytic research into turnover to find any significant relationship between search intention and turnover (Hom, Caranikas-Walker, Prussia & Griffeth 1992). Setting aside the epistemological and methodological problems associated with ‘intent to’ variables (Dalton, Johnson and Daily 1999; Vandenberg and Nelson 1999), it should be seen that the refinement of job search into passive and active search does nothing to strengthen the case for a relationship between search intention and turnover, because expression of ‘intent to search’ automatically excludes passive search.

The search account also discounts the influence of other potential determinants of individuals’ choice of work. Describing an individual’s setting of a ‘reservation price’ may be too simplistic an explanation to account for the complex heuristics people employ in career and job choice. It may be that whereas there is a significant economic dimension to an individual’s decision to accept an offer of work, the pure economic

account does not pay sufficient attention to situations where people derive intrinsic satisfaction (Tang, Kim and Tang 2000). In short job search and job opportunity may be too complex to be described using impersonal variables and a rational-economic model of decision making.

Objective Opportunities

Although there is support at the macro level, in terms of base rates of turnover and unemployment, to suggest a relationship between employment opportunity and turnover (Carsten and Spector 1987; Hulin et al. 1985; Terborg and Lee 1988), these data are not useful when it comes to explaining or predicting individual decisions to quit (Dreher 1980), which is important given the focus of effective management of turnover (Mobley 1982).

Kirschenbaum and Mano-Negrin (1999) make the case that instead of using 'perceived job opportunity', it would be better to use an objective measure of opportunities based on a model of interaction between the local labour market, occupational opportunity (by labour market sector) and organizational size. The problems with using macro data such as base rates for turnover to manage turnover effectively may be mitigated by applying more sophisticated models of the labour market;

...the structural constraints of organizational and occupational internal labour markets may be crucial for the accurate prediction of actual turnover behaviour
(1239)

Although they make a case for objective measurement of opportunities in general, in their particular study of workers at seven hospitals, Kirschenbaum and Mano-Negrin place little weight on the role of normative commitment or a professional ethic, relying instead on a view of the 'occupational labour market'. Kirschenbaum and Mano-Negrin apply this model equally to explain the decision to leave of all the respondents in their sample. This is potentially problematic because nearly one sixth of their respondents are clerical workers, who may have a number of different exit strategies to nurses or doctors. Even within a rational economic account, there is evidence to suggest that people with longer periods of training may be unwilling or feel unable to look for opportunities outside the health care sector, as they have invested in their training and have 'sunk costs' (Becker 1960; Mercer 1979; Rusbult and Farrell 1983). Either interpretation undermines Kirschenbaum et al.'s construction of 'objective opportunities'.

Hulin et al. (1985) suggest three ways in which employment opportunity might influence quitting directly, without the need for an interaction with 'perceived opportunity', or 'job search'. They suggest that different economic conditions can produce different workforces and therefore different patterns of turnover (such as higher turnover among 'drifters'); alternatively, job opportunities may influence job satisfaction directly, perhaps because of the 'insufficient justification paradigm' (Salancik and Pfeffer 1978; Pfeffer and Lawler 1980) or the direct influence of economic activity on satisfaction (Hulin et al. 1985: 243); the final way in which the difficulties of a 'perceived opportunity' or 'search' element to turnover might be avoided is where job opportunities directly influence turnover (where employees quit on the basis of actual, concrete opportunities).

The benefits of Hulin et al.'s account are various. It portrays leavers as heterogeneous rather than identical as is the case in the traditional economic account. 'Drifters' may leave via a non-conventional route, bypassing familiar accounts which postulate linkages from satisfaction to turnover (Mobley 1977). Hulin et al.'s account is also more sophisticated than the pure labour market account of turnover in including the possibility of people leaving for non-work alternatives, which are not captured in any previous definitions of 'perceived opportunity'.

The definition of a labour market outlined above refers to the 'price' of exchange, and this is equated with pay (a wage). Yet there is a well-established body of literature, in addition to the literature on commitment, concerning motivation (McGregor 1960; Herzberg 1968) to suggest that for at least some individuals, pay is not the sole motivating factor (Tang et al. 2000). If it is allowed that motivation has some link with job choice then pay will not be the sole criterion used when people decide on selecting a job, or when they decide to continue within an existing job. Thus a labour market explanation may be inadequate to account for decisions to quit. It should be noted that Lazear (1995: 4) believes, that reward need not be expressed solely in the form of a wage. However his approach remains faithful to a pure economic account of turnover in that he believes that 'nonpecuniary components' can be, "... converted into their monetary equivalents in the course of the [economic] analysis". These 'nonpecuniary components' (giving the examples of status, working conditions) he refers to as 'psychic income'.

If we accept this, all the 'humanist' challenges to a pure economic account of turnover would collapse, as the remodelling of such concepts as 'status' would allow for us still to use the initial definition of a labour market to account for turnover. All that we would

need to do to refine this model, would be to incorporate a notion of ‘psychic income’ within our notion of a price for labour. There are however, epistemological and ontological problems with this type of reductionist explanation which make it unpalatable. There are problems of knowledge i.e. with how we identify and measure these concepts, and there are problems with the precise status we accord these ‘nonpecuniary components’, i.e. how do we translate and cross-validate them. The theme of non-monetary determinants will be expanded on in the section on socio-psychological approaches to turnover.

Labour Market Scope

There is also a problem with defining scope in the labour market account. Although buyers and sellers of labour need to ‘meet or communicate’, there seems to be no easy way of universally defining the size of, or demarcating ‘the labour market’. It may be that we can choose to set aside rigorous definition of a labour market, or define it on an ad hoc basis, if all we wish to do is to decide on the scale of a recruitment campaign.

Unfortunately, this approach is not comprehensive enough if we wish to use the economic model to look at labour turnover within a particular context. Nor will this approach facilitate the prediction of levels of labour demand and supply, or price. It thus becomes necessary to define the scope of the labour market, if we wish to assess its impact on employment conditions within a geographical area, industry sector, or at a site level. In each of these instances, if we are to use the economic model, we have to first delimit the scope of the labour market, otherwise it is impossible to identify the number of actors and their (individual or collective) bargaining power. Equally, it is not possible to assess the volume of work. Only by defining the scope of the labour market can we identify these

key variables. One way in which this problem of scope has been approached, has been through the use of the term 'local labour market'. Flowerdew and Green (1993) offer a definition of a local labour market, defined principally in terms of 'travel to work areas' (TTWA's), which are in turn defined by the Department of Education and Employment in these terms.

75% of journeys to work start and finish in them

Minimum resident population is 3.5 K

Should be mutually exclusive

Should cover the whole country (Source: Bosworth et al.: 176)

It should be seen that this definition of the scope of a local labour market, could be challenged if concern is turnover in a particular context. Indeed one might make the case that rather than local labour markets being defined in geographical terms, they could be defined in industry terms. Kirschenbaum and Mano-Negrin (1999) develop the idea of an occupational labour market, and as well as other theorists, stress the significance of an internal, or organizational labour market (Pfeffer and Cohen 1984) for the retention of staff. One problem with extending this idea is that to have a comprehensive account of local labour markets, one would need one for virtually every firm, (or even each job) which would be far more cumbersome than the DofEE's framework.

The labour market approach does have enormous potential in the modelling of turnover. If certain assumptions are allowed, then this account can allow for the conceptualization of a wide variety of situations, based on the variation of labour demand, supply and volume of work. However, the inability of this approach to allow for imperfect

awareness and heterogeneity, as well as problems in defining scope, and the role of non-monetary determinants makes operationalization of this account problematic. It will be seen that some of these generic threats to the utility of the labour market account also serve to challenge aspects of the socio-psychological account of labour turnover, which is outlined below.

The Psychological School

Within what we have chosen to call the psychological school, analysis of labour turnover is geared towards explaining or predicting individuals' decisions to leave. Psychological accounts thus concern themselves more with individual choice, and although they offer mainly unitary models which assume homogeneity amongst employees, they may be more readily suited to assisting the development of policies or strategies to enable the effective management of turnover than economic or labour market accounts. Labour market accounts focus more on macro issues such as opportunity or unemployment, or, they portray employees as actors equally subject to external forces, and thus preclude the use of selective or focused human resource strategies. Psychological accounts focus on employees, and they are thus more readily suited to enabling the effective management of turnover, by offering potential to concentrate efforts or resources on a key group of employees, or even on an individual employee. This is important if we bear in mind the need for assessing functionality and also avoidability. Broadly speaking, these accounts may be classed as voluntarist, as they emphasise the role of individual choice, whereas economic accounts are more typically determinist, as they emphasise the formative role of external influences such as alternative opportunities (Muchinsky and Morrow 1980).

The power of the psychological school of modelling, as we shall see, lies partly in its ability to describe turnover again in a unitary fashion, albeit from a different perspective. Although the dimension of choice is explicitly recognised within psychological accounts of turnover, these accounts often assume that decisions about leaving an organization only include considerations of work issues (Lee and Mitchell 1991). Intuitively this should be seen as problematic as often the reasons people have for leaving an organization have

nothing to do with their life at work (Lee et al. 1996). Yet this is not a necessary limitation of a unitarist account of turnover which could easily include non-work factors as reasons for leaving.

One criticism of the pure economic account can be that it fails to capture the complexity of the process of turnover within an individual firm. Pure economic analyses of turnover may also generate solutions that are inoperable, e.g. the firm may not have the ability to vary pay, or to influence the labour market variables. Psychological accounts can be seen to address this, in so far as they incorporate a range of nonpecuniary variables, which also increases scope for managerial and organizational agency.

March and Simon

March and Simon (1958: 99) indicate in their model of determinants of labour turnover that job satisfaction is the principal lever affecting 'employee perceptions of the desirability of movement'. We can judge the extent to which their model has been influential by the frequency with which it is cited by contemporary turnover theorists (Hom and Griffeth 1995; Kirschenbaum and Mano-Negrin 1999). Indeed Lee and Mitchell (1994: 69-70) indicate that the success of this model may have hampered research;

March and Simon's (1958) landmark chapter on the decision to participate may have overly influenced the subsequent conceptual models of employee turnover.

March and Simon's model (below) has limitations, as does any attempt to capture and code a complex process. Such models provide ways of seeing a given situation, with a view to better understanding it, but Morgan's caveat on metaphor also applies here, "in creating ways of seeing they tend to create ways of *not* seeing. (Morgan 1997: 348)."

Simplified version of March and Simon's Model (1958: 99)

(Figure 3 here)

The importance of this model can be assessed in terms of the number of ideas which it incorporates that are still the object of turnover researchers' attention. The labour market account of turnover can be incorporated within this model in terms of the internal and extra-organizational opportunities, with expected utility being assessed in terms of 'perceived desirability' and 'perceived ease'. The conformity, predictability and compatibility components of job satisfaction potentially relate to the psychological account.

March and Simon's account of motivation is based on the theory of 'organizational equilibrium', which can be traced back to Barnard (1938). This describes how a balance is struck both for the organization and its employees in terms of inducements and contributions which ensures continued survival of the organization. The organization offers inducements (i.e. pay) to encourage employees to participate, and contribute (i.e. work). Where these inducements are increased, this reduces the propensity of the employee to leave and vice versa. Leaving is ultimately determined by two distinct factors, namely 'perceived desirability of movement' which is influenced by job

satisfaction and 'perceived ease of movement' i.e. assessment of perceived alternatives or opportunity (Hom and Griffeth 1995: 51-53).

Limitations of the model include an overemphasis on the importance of pay as a motivator, at the expense of other intrinsic sources of satisfaction. Although pay may be conceptualised as motivating (Lawler 1981), and although the model refers more generally to job satisfaction, an underlying construction of equilibrium assumes the commensurability of variables. This is possible where we have an organization and its employees in a utility relationship, characterised by exchange of inducement and contributions, but far harder if we include elements such as professionalism (Bartol 1979) or role stress (Kemery et al. 1985) neither of which are as readily applied to an organization. Assumptions of equilibrium and balance ultimately limit research to variables which are commensurable, which is deeply problematic if we wish to include both economic and psychological elements in analysis of turnover.

A further limitation in March and Simon's model is that it only partially helps us address the idea that different forms of commitment may influence turnover, yet there has been consistently strong support for the idea that commitment (in various guises) is important to the assessment of turnover (Allen and Meyer 1990; Boshoff and Mels 2000; Chang 1999; Porter et al. 1974). Although the dimensions of calculative, (exchange or continuance) commitment (Becker 1960; Somers 1995) may be captured by an emphasis on pay, research indicates there are other 'non-instrumental' components of commitment (Gaertner and Nollen 1989: 975) such as normative or moral commitment (Jaros, Jermier, Koehler and Sincich 1993), or career commitment (Bedeian et al. 1991) which influence turnover.

March and Simon's model presents a static view of the decision to leave. Firstly, as a content model, it offers little sense of the processual dimension to turnover. Secondly, although there is included within this framework an expected utility element, this does not lend enough weight to the possibility that turnover decisions may be influenced by aspirations of longer term development, and may be predicted not only by career type, but also by career stage and by an employee's assessment of a particular organization's career development opportunities (Krau 1981). This goes beyond a labour market view of 'alternative opportunities', but includes the notion that, "...a company is not only the place of a technical-economic activity providing jobs, but also a means for implementation of aspirations and need fulfilment (ibid. 789)."

Subsequent development of theory within the psychological school of turnover research can be outlined with reference to three further models, namely Price and Mueller's (1986) causal model, Mobley et al.'s (1979) 'expanded' model and Sheridan and Abelson's (1983) catastrophe model. We have already indicated that classification of the literature on turnover is wont to be arbitrary. Our rationale for choosing to assess these three models is that they represent a broad range of approaches to analysing the turnover phenomenon, as well as each representing a departure from March and Simon's account. In this way we hope to cover the literature within the psychological school comprehensively insofar as we might offer analysis in sufficient detail, though we accept we have omitted to discuss other significant accounts of turnover in equal detail (Hom and Griffeth 1991; Lee, Mitchell, Holtom, McDaniel and Hill 1999; Porter and Steers 1973; Steers and Mowday 1981)

Price and Mueller's (1986) Causal Model

This places emphasis on analysing the causal determinants of turnover, and outlining the causal pathways between antecedent variables such as 'routinization' and the ultimate dependent variable 'turnover'. This stress on a comprehensive list of determinants is in contrast to other models (such as March and Simon's), which seek a more generic account of factors such as job satisfaction, and can be traced back to Price's goal of codification which is to provide researchers with, "...a list of mutually exclusive and exhaustive determinants to conduct the study efficiently (Price 1977: 3)."

The advantages of his approach are that it offers a methodical and comprehensive review of the literature and empirical data on turnover. The benefits of this comprehensive review can be seen in terms of the model below, where selection of hypothetical determinants has empirical as well as a priori theoretical support. There is also substantial research evidence (Price 1977: 66-91; Price and Mueller 1981: 9-25) to support many of the causal linkages in the 1986 model.

Price and Mueller's Causal Model

(Figure 4 here)

Although this model represents a second generation refinement and extension of the (1977) 'structural' model of turnover, the support for it in Price and Mueller's research was weak (1986: 203), and the causal claims of their model are further undermined by their having found significant relationships between null pathways (Hom and Griffeth 1995: 62). Additionally, although it was hypothesised that turnover and absence were

each dimensions of a withdrawal construct (Price and Mueller 1986: 2), the model was even less good at explaining employee absence (ibid. 205).

A further limitation is that testing of this model has been restricted to hospital staff (Hom and Griffeth 1995: 63). Other researchers emphasise the need for occupational heterogeneity in turnover studies (Mathieu and Zajac 1990: 191), although there is evidence to suggest that there are few differences between the study of nurses and other occupations in terms of turnover and theory testing (Hom et al. 1992: 904).

Price and Mueller's model has been included in this review of the psychological school of turnover research because it represents one tradition or perspective which researchers on turnover may take. Supplementing the account of a seminal content model (March and Simon 1958), the analysis of a causal or structural account is helpful because it highlights an alternative, dynamic account of turnover. Such a perspective has its advantages, in that it is more implicitly processual, and thus formally reflects the view that turnover is the result of a decision process. Nonetheless, it is also limited particularly where the causal relationships postulated are as prescriptive and rigorous as in the model above. Price and Mueller's model outlines a series of unidirectional causal relationships with turnover as the dependent variable, yet despite (discrete) empirical support for the existence of these relationships, so far there is inadequate support for the model as a whole. The failure of Price and Mueller's account to explain turnover (Price and Mueller 1986: 203) may be evidence that a comprehensive theory requires more than just the ordered summation of empirical findings, and rigorous testing of causal pathways. It may be that the lack of an underlying theory of behaviour or action such as is offered in March and Simon's account, limits the potential for this model to offer explanation.

Mobley Griffeth, Hand and Meglino's 1979 Expanded Model

This offers an account which portrays 'search and quit intentions' as the precursor to turnover. Incorporating ideas from expectancy theory, and from earlier turnover models, this model offers a more comprehensive account than either Price and Mueller or March and Simon, principally because it is multivariate in scope, including organizational, environmental and individual variables. The model suggests there are four principal determinants of the decision to quit, namely job satisfaction, expected utility of alternate roles within the organization, expected utility of alternate roles outside the organization, and non-work values and roles.

Mobley et al.'s 'expanded' model (adapted from Mobley et al. 1979: 517)

(Figure 5 here)

The theoretical basis for Mobley et al.'s construct of job satisfaction is Locke's (1975) theory that this arises from individualized evaluation of the job and comparison with one's personal values (Mobley 1982). This has advantages over Price and Mueller's account because it emphasises individual difference. For example, whereas Price and Mueller see routinization as a global construct which they hypothesise is negatively related to satisfaction, Mobley et al.'s account allows for the possibility that a factor such as this might influence different employees in different ways. So, whereas one individual might find routine dissatisfying, or demotivating, another may value the same level of routine in their work, perhaps because it affords them stability, or suits their non-work roles. That the model allows scope for individual difference can be taken as evidence that it is a more useful heuristic device in the effective management of turnover than Price and Mueller's model. Whereas Price and Mueller's model offers an account of once and for all causal relationships which for the most part are theorised to apply equally to all organizational members, Mobley et al.'s account allows us to see how certain initiatives may selectively influence satisfaction. It also stresses the importance of employee perceptions, which undermines a straightforward translation of the labour market account of turnover, such as the 'opportunity' variable in Price and Mueller's model would suggest. Equally this emphasis on perceptions makes explicit the problems with rendering variables such as 'distributive justice' (from Price and Mueller) commensurable and quantifiable. Although this emphasis on individualised perception may mean that a precise ordering of relationships between (say) distributive justice and turnover is ultimately unrealisable

because of epistemological and logistical constraints, it may increase the scope to use the ‘expanded’ model as a basis for understanding rather than prediction.

A further advantage this model offers over Price and Mueller’s account is that it emphasises expectancy, that is anticipation of future outcomes. Whereas it is clear that satisfaction is a present-oriented evaluation (Mobley 1982), by itself this does not address the expectancy of future satisfaction. Whereas Price and Mueller’s model posits a direct link from satisfaction to turnover, there is no explicit recognition that expectancy is a key factor in determining turnover decisions. The inclusion of expected utility in the assessment of both internal and external job options means that the ‘expanded’ model is more rigorous in its assessment of the satisfaction construct. It should be intuitively obvious that it is possible for individuals to be dissatisfied at work, yet to remain in the hope or expectation that things will improve, particularly in occupations where a period of apprenticeship or basic training is mandatory. For example, junior doctors may work very long hours whilst qualifying, yet tolerate this knowing that it is only to be for a relatively short period of their career. Equally, it may well be that satisfied employees leave, either because they are aware the situation is about to change for the worse, or in the expectation that they may increase their levels of satisfaction. None of these three scenarios is accounted for adequately in Price and Mueller’s model, yet the inclusion of an expectancy dimension, and an emphasis on individualized evaluation allows for these leaving scenarios to be explained and modelled within the ‘expanded’ model.

One limitation of this model is a function of its complexity and comprehensiveness.

Because it addresses economic, individual, environmental and organizational variables as well as emphasising values, and expectancy, empirical assessment of the model as a

whole is difficult (Mobley 1982: 125). Such an assessment would need to be detailed enough to capture individual assessments of particular variables, as well as find a means of translating measures of expected utility for internal and external work options. As a result research (Griffeth and Hom 1988; Youngblood, Mobley and Meglino 1983) has only validated, or partly validated portions of the model (Hom and Griffeth 1995: 66).

Another limitation which this model shares with that of Price and Mueller (1986) is that it sees search or quit *intention* as an immediate precursor to turnover behaviour. Recent research (Dalton et al. 1999; Vandenberg and Nelson 1999) has undermined the validity of assessment of ‘intent to’ variables, and it may be that given method and epistemic constraints, inclusion of an intent variable as a turnover proxy would limit the operationalising of both the ‘expanded’ model and other, similar models (e.g. Boshoff and Mels 2000; Lum et al 1998).

The ‘Cusp-Catastrophe’ Model

The final model which we have chosen to include within the psychological school has been developed by Sheridan and Abelson (1983), and offers a far more complex account of the intrinsic properties of the turnover phenomenon than the prior models. It further undermines the notion of a measurement-prediction agenda in turnover research.

Although less a model about the decision process, and more about the phenomenon of turnover per se, its inclusion within this school of turnover research is warranted as it includes psychological rather than economic factors.

Sheridan and Abelson's model is based on a branch of mathematics known as catastrophe theory (Sheridan 1985: 88), which is formally suited to describing turnover behaviour, as it has been used in the physical, biological and social sciences in the modelling of a range of discontinuous events. The advantages of using this particular epistemological basis are that it enables their model to reflect the threshold nature of turnover behaviour, which is as McEvoy and Cascio describe, "...a dichotomization of the continuous variable called tenure (1987: 750)."

The catastrophe model has been applied more generally to 'employee withdrawal' (Sheridan 1985), where turnover is seen as one of a range of withdrawal responses including absenteeism and lower job performance resulting from reduced sociopsychological attraction or interest in the organization (following Bluedorn 1982). Although this view is in common with some other researchers (Martin et al. 1981) who see turnover as one of several related behaviours, rather than a discrete phenomenon, the implications of a 'catastrophe' account can be examined without accepting this as yet unsubstantiated theory. Within the 'catastrophe' account;

... job termination represents a qualitatively different behavioural state than does employee retention and may not be associated with large changes in the variables influencing withdrawal. Instead, the presumed causes of withdrawal may have been changing slowly and smoothly until some threshold is reached that results in an abrupt change from job retention to termination (Sheridan and Abelson 1983: 419).

Such an account is seen to address several limitations in turnover research to date. Firstly previous research mainly deals with heterogeneous cross-sectional samples of employees from the same organization and does not control for differences in career stage or other demographic variables which may influence the turnover process (Sheridan 1985: 89). Secondly, the time interval between conducting the study and instances of turnover is likely to affect predictive validity (Sheridan and Abelson 1983: 419). Thirdly, research has relied mainly on cross-sectional studies, which are used to predict quits within a given period. These studies may predict turnover moderately well, but they offer no account of the successive or processual dynamic (ibid.). A final, and crucial limitation is that these studies on the whole assume linear and continuous relationships between antecedent factors and turnover which does not reflect the threshold nature of the phenomenon.

The model has three main characteristics (Sheridan and Abelson 420-422):

Turnover is a discontinuous variable characterised by abrupt change, and a 'delay rule' which reflects the idea that employees try to stay in employment for as long as possible. Once employees feel they can no longer stay, they abruptly change from retention to termination (voluntary turnover).

There is a 'hysteresis zone' representing a state of disequilibrium for employees about to change from retention to termination. This is described as 'a fold in the behaviour surface', the shadow of which is projected onto the control surface as the bifurcation plane. Either side of the bifurcation plane there is more stable behaviour, in the retention plane or termination plane.

Divergent behaviours may occur on opposite sides of the bifurcation plane. The implications of this are that as employees near this bifurcation plane, very small changes

in the control variables (here ‘job tension’, ‘job dissatisfaction’ and ‘job stress’) may cause discontinuous change from retention to termination.

Sheridan and Abelson’s Cusp Catastrophe Model of Turnover (1983: 421)

(Figure 6 here)

The inability to represent more control variables means this account is restricted to a partial account of the various motives for turnover which are reflected in other more comprehensive accounts such as those offered by Price and Mueller and Mobley et al. Nevertheless, the catastrophe model does make two significant contributions to turnover research. Firstly, there is an explicit recognition that turnover is a discontinuous dynamic phenomenon. This calls into question the predominant (and still prevalent) methodology in turnover research of cross-sectional measurement then prediction. The implications of a hysteresis zone of behaviour, and the possibility of divergent behaviours either side of this zone, mean that predictive power is ultimately limited in research which relies on cross-sectional sampling of employees, and the catastrophe model provides a coherent alternative way of capturing the processual element to this phenomenon. The second, more abstract contribution that this model makes is in demonstrating the possibility of alternate conceptualizations of the turnover phenomenon, and in indicating possible directions for future research outside the dominant paradigm. It represents a, “...provocative divergence from traditional linear thinking [and] a significant theoretical milestone (Hom and Griffeth 1995: 78)”, and as such merits discussion¹.

¹ It is worth noting that some theorists (Sokal and Bricmont 1998: 127) express reservations about the validity of transferring ideas such as catastrophe theory from mathematics to the social sciences. It may be

The Need for New Theory

There is indication in the poor explanatory and predictive power of most models of turnover that the ecological validity of such models is weak. A variety of reasons have been presented for the inability of these models to explain or predict turnover adequately, yet most research into turnover continues to be paradigm based, resulting in incremental or insignificant theory development. Much research still focuses on the role of variables which moderate relatively well established relationships. Within the psychological school examples of this are the satisfaction – turnover (Tang et al. 2000) or commitment – turnover (Chang 1999) relationships; examples in the economic school include analysis between opportunity – turnover (Kirschenbaum and Mano-Negrin 1999) and pay – turnover (Lum et al. 1998). This is despite there being underlying questions regarding the predictive validity and explanatory potential of such relationships (Aquino et al. 1997). In addition, some of these studies (Chang 1999; Lum et al 1998) overlook or sidestep some epistemological problems associated with turnover research (Dalton et al. 1999), for example in the unquestioning use of proxy or surrogate variables such as ‘intent to turnover’ or ‘withdrawal cognitions’.

Research is also still dominated by the thinking of influential theorists such as March and Simon and consequently describes incremental rather than substantial development.

Aquino et al (1997) have echoed the comments of O’Reilly (1991), in suggesting that

more consistent to see Sheridan and Abelson’s model as using catastrophe theory in a metaphorical sense, given there are no meaningful equations to model constructs such as job tension, and it is problematic to talk of behaviour as having a ‘surface’. Nonetheless, we do not feel this undermines the particular theoretical contributions of the account to turnover research as outlined above.

turnover research is 'in a fallow period' and in need of rejuvenation. Of course the existence of a research paradigm and a subsequent focus on incremental improvement in building theory may not be problematic, in so far as where adequate accounts of phenomena exist, there may be little need to change these accounts, if they satisfy certain criteria, for example, predictive power. If we adopt a managerialist perspective in considering the effective management of turnover, then the motivation for use and development of theory will not be (to some extent aesthetic) considerations of theoretical merit, but more pragmatic notions of what 'gets the job done'. Although a pragmatic perspective may not lead to the *most* effective management actions (where for example it prevents pursuit of other, more effective strategies), if it allows for a degree of effectiveness, then any incremental improvements will represent progress. Where a theory has 'practical adequacy' (Sayer 1992), it may be used without refinement indefinitely.

If there were a powerful, or practically adequate theory of employee turnover, then the lack of 'new' research would be of little concern. However, the problematic aspects of the current paradigm-based research are;

Theories within either the economic or psychological schools have little predictive power, nor do they offer empirically supported assertions about turnover which can help the effective management of turnover.

Research is restricted by dominant ideas which focus mainly on relationships between an affective state and turnover.

Whilst it is accepted that there are likely to be limitations to any generic explanation of this complex phenomenon, the scope to identify universal elements of the turnover process should not be ignored. A contemporary example of an account which represents a break from the established paradigm is the ‘unfolding’ model (Lee et al. 1999), which is a path model of the turnover process, based on an ‘image theory’ of decision making (Beach 1990; Beach and Strom 1989; Mitchell and Beach 1987). It is beyond the scope of this paper to critique the model in detail, though we have done so more comprehensively elsewhere (Morrell et al, 2001), nonetheless, this review of the literature provides support for the idea that such innovation as the unfolding model represents is needed within the field of turnover research.

References

- Abelson M. A. (1987). Examination of Avoidable and Unavoidable Turnover, *Journal of Applied Psychology*, **72**: 382-386.
- Allen N. J. and Meyer J. P. (1990). The measurement and antecedents of affective, continuance and normative commitment to the organization, *Journal of Occupational Psychology*, **63**: 1-18.
- Aquino K., Griffeth R. W., Allen D. G. and Hom P. W. (1997). Integrating Justice Constructs into the Turnover Process: A Test of a Referent Cognitions Model, *Academy of Management Journal*, **40**: 1208-1227.
- Bannock G., Baxter R. E. and Davis E. (1988). *The Penguin Dictionary of Economics*, Penguin, Middlesex.
- Barnard C. I. (1938). *The Functions of the Executive*, Harvard University Press, Mass.
- Bartol K. M. (1979). Professionalism as a Predictor of Organizational Commitment, Role Stress and Turnover: A Multi-Dimensional Approach, *Academy of Management Journal*, **22**: 815-822.
- Beach L. R. (1990). *Image theory: Decision making in personal and organizational contexts*, Wiley, Chichester.
- Beach L. R. and Mitchell T. R. (1987). Image theory: Principles, goals and plans in decision making, *Acta Psychologica*, **72**: 201-220.
- Beach L. R. and Strom E. (1989). A toadstool among the mushrooms: Screening decisions and image theory's compatibility test, *Acta Psychologica*, **72**: 1-12.
- Becker H. S. (1960). Notes on the concept of commitment, *American Journal of Sociology*, **66**: 32-42.

- Bedeian A. G., Kemery E. R. and Pizzolatto A. B. (1991). Career Commitment and Expected Utility of Present Job as Predictors of Turnover Intentions and Turnover Behavior, *Journal of Vocational Behavior*, **39**: 331-343.
- Blau G. (1989). Testing the Generalizability of a Career Commitment Measure and Its Impact on Employee Turnover, *Journal of Vocation al Behaviour*, **35**: 88-103.
- Blau G. and Boal K. B. (1987). Conceptualizing How Job Involvement and Organizational Commitment Affect Turnover and Absenteeism, *Academy of Management Review*, **12**: 288-300.
- Blau T. (1964). *Exchange and power in social life*, Wiley, New York.
- Boshoff C. and Mels G. (2000). The Impact of Multiple Commitments on Intentions to Resign: an Empirical Assessment, *British Journal of Management*, **11**: 255-272.
- Bosworth D., Dawkins P. and Stromback T. (1996). *The Economics of the Labour Market*, Addison Wesley, Harlow.
- Brett J. M. and Reilly A. H. (1988). On the Road Again: Predicting the Job Transfer Decision, *Journal of Applied Psychology*, **73**: 614-620.
- Bretz R. D., Boudreau J. W. and Judge T. A. (1994). Job Search Behavior of Employed Managers, *Personnel Psychology*, **47**: 275-301.
- Campion M. A. (1991). Meaning and Measurement in Turnover: Comparison of Alternative Measures and Recommendations for Research, *Journal of Applied Psychology*, **76**: 199-212.
- Carsten J. M. and Spector P. E. (1987). Unemployment, Job Satisfaction, and Employee Turnover: A Meta-Analytic Test of the Muchinsky Model, *Journal of Applied Psychology*, **72**: 374-381.
- Chang E. (1999). Career Commitment as a Complex Moderator of Organizational Commitment and Turnover Intention, *Human Relations*, **52**: 1257-1278.

- Checkland P. (1981). *Systems Thinking, Systems Practice*, Wiley, Chichester.
- Cheng A. and Brown A. (1998). HRM Strategies and labour turnover in the hotel industry: A comparative study of Australia and Singapore, *The International Journal of Human Resource Management*, **9**: 136-155.
- Clark-Rayner P. and Harcourt M. (2000). The Determinants of Employee Turnover Behaviour: New Evidence from a New Zealand Bank, *Research & Practice in Human Resource Management*, **8**: 61-71.
- Cohen A. (1999). Turnover among Professionals: A Longitudinal Study of American Lawyers, *Human Resource Management*, **38**: 61-75.
- Dalton D. R., Krackhardt D. M. and Porter L. W. (1981). Functional Turnover an Empirical Assessment, *Journal of Applied Psychology*, **66**: 716-721.
- Dalton D.R., Todor W. and Krackhardt D. (1982). Turnover Overstated: The functional taxonomy *Academy of Management Review* **7**: 117-23.
- Dalton D. R., Johnson J. L. and Daily C. M. (1999). On the use of “Intent to...” Variables in Organizational Research: An Empirical and Cautionary Assessment, *Human Relations*, **52**: 1337-1350.
- DeCottis T. A. and Summers T. P. (1987). A Path Analysis of a Model of the Antecedents and Consequences of Organizational Commitment, *Human Relations*, **40**: 445-470.
- Dreher G. F. and Dougherty T. W. (1980). Turnover and Competition for Expected Job Openings: An Exploratory Analysis, *Academy of Management Journal*, **23**: 766-772.
- Forbes A. and McGill D. (1985). Understanding Wastage, *IMS*, no. 101.

- Gaertner K. N. and Nollen S. D. (1989). Career Experiences, Perceptions of Employment Practices, and Psychological Commitment to the Organization, *Human Relations*, **42**: 975-991.
- Gerhart B. (1990). Voluntary Turnover and Alternative Job Opportunities, *Journal of Applied Psychology*, **73**: 467-476.
- Griffeth R. W. and Hom P. W. (1988). A comparison of different conceptualizations of perceived alternatives in turnover research, *Journal of Organizational Behavior*, **9**: 103-111.
- Holt C. C. and David M. H. (1966). The Concept of Job Vacancies in a Dynamic Theory of the Labour Market in *The Measurement and Interpretation of Job Vacancies*, National Bureau of Economic Research, New York.
- Hom P. W. (1992). Turnover costs among mental health. In Hom P. W. and Griffeth R. W. (eds.) *Employee Turnover*, South Western Publishing USA (1995).
- Hom P. W., Caranikas-Walker, Prussia G. E. and Griffeth R. W. (1992). A Meta-Analytical Structural Equations Analysis of a Model of Employee Turnover, *Journal of Applied Psychology*, **77**: 890-909.
- Hom P. and Griffeth R. (1991). Structural Equations Modelling Test of a Turnover Theory: Cross-sectional and Longitudinal Analyses, *Journal of Applied Psychology*, **76**: 350-66.
- Hom P. and Griffeth R. (1995). *Employee Turnover*, South Western Publishing, USA.
- Hulin C. L., Roznowski M. and Hachiya D. (1985). Alternative Opportunities and Withdrawal Decisions: Empirical and Theoretical Discrepancies and an Integration, *Psychological Bulletin*, **97**: 233-250.

- Huselid M. A. and Day N. E. (1991). Organizational Commitment, Job Involvement, and Turnover: A Substantive and Methodological Analysis, *Journal of Applied Psychology*, **76**: 380-391.
- Jackofsky E. F. (1984). Turnover and job performance: An integrated process model, *Academy of Management Review*, **9**: 74-83.
- Jackofsky E. F., Ferris K. R. and Breckenridge B. G. (1986). Evidence for a curvilinear relationship between job performance and turnover, *Journal of Management*, **12**: 105-111.
- Jaros S. J., Jermier J. M., Koehler J. W. and Sincich T. (1993). Effects of Continuance, Affective and Moral Commitment on the Withdrawal Process: An Evaluation of Eight Structural Equation Models, *Academy of Management Journal*, **36**: 951-995.
- Johnson P. and Gill J. (1997). *Research Methods for Managers*, Sage, London.
- Keller R. T. (1984). The role of performance and absenteeism in the prediction of turnover, *Academy of Management Journal*, **27**: 176-183.
- Kemery E. R., Bedeian A. G., Mossholder K. W. and Touliatos J. (1985). Outcomes of Role Stress: A Multisample Constructive Replication, *Academy of Management Journal*, **28**: 363-375.
- Kirschenbaum A. and Weisberg J. (1994). Job Search, Intentions and Turnover: The Mismatched Trilogy, *Journal of Vocational Behavior*, **44**: 17-31.
- Kirschenbaum A. and Mano-Negrin R. (1999). Underlying Labor Market Dimensions of "Opportunities": The Case of Employee Turnover, *Human Relations*, **52**: 1233-1255.
- Krackhardt D. and Porter L. W. (1986). The Snowball Effect: Turnover Embedded in Communication Networks, *Journal of Applied Psychology*, **71**: 50-55.

- Krau E. (1981). Turnover Analysis and Prediction from a Career Developmental Point of View, *Personnel Psychology*, **34**: 771-790.
- Laker D. R. (1991). Job Search, Perceptions of Alternative Employment and Turnover, *Journal of Applied Business Research*, **7**: 6-15.
- Lawler E. E. (1981). *Pay and organization development*, Addison-Wesley, Reading.
- Lazear E. P. (1995). *Personnel Economics*, MIT, USA.
- Lee T. W. (1988). How Job Dissatisfaction Leads to Employee Turnover, *Journal of Business and Psychology*, **2**: 263-271.
- Lee T. W. and Maurer S. D. (1997). The Retention of Knowledge Workers with the Unfolding Model of Voluntary Turnover, *Human Resource Management Review*, **7**: 247-275.
- Lee T. W. and Mitchell T. R. (1991). The Unfolding Effects of Organizational Commitment and Anticipated Job Satisfaction on Voluntary Employee Turnover, *Motivation and Emotion*, **15**: 99-121.
- Lee T. W. and Mitchell T. R. (1994). An Alternative Approach: The Unfolding Model of Voluntary Employee Turnover, *Academy of Management Review*, **19**: 51-89.
- Lee T. W. and Mowday R. T. (1987). Voluntarily Leaving an Organization: An Empirical Investigation of Steers and Mowdays Model of Turnover, *Academy of Management Journal*, **30**: 721-743.
- Lee T. W., Ashford S. J., Walsh J. P. and Mowday R. T. (1992). Commitment Propensity, Organizational Commitment, and Voluntary Turnover: A Longitudinal Study of Organizational Entry Processes, *Journal of Management*, **18**: 15-32.
- Lee T. W., Mitchell T. R., Holtom B. C., McDaniel L. S. and Hill J. W. (1999). The Unfolding Model of Voluntary Turnover: A Replication and Extension, *Academy of Management Journal*, **42**: 450-462.

- Lee T. W., Mitchell T. R., Wise L. and Fireman S. (1996). An Unfolding Model of Voluntary Employee Turnover, *Academy of Management Journal*, **39**: 5-36.
- Locke E. A. (1975). Personnel attitudes and motivation, *Annual Review of Psychology*, **25**: 457-480.
- Lum L., Kervin J., Clark K., Reid F. and Sirola W. (1998). Explaining nursing turnover intent: job satisfaction, pay satisfaction, or organizational commitment?, *Journal of Organizational Behavior*, **19**: 305-320.
- McEvoy G. M. and Cascio W. F. (1987). Do Good or Poor Performers Leave? A Meta-Analysis of the Relationship between Performance and Turnover, *Academy of Management Journal*, **30**: 744-762.
- March J. G. and Simon H. A. (1958). *Organizations*, Wiley, New York.
- Marchington M. and Wilkinson A. J. (1996). *Core Personnel and Development*, IPD, London.
- Martin T. N., Price J. L. and Mueller C. W. (1981). Job performance and turnover, *Journal of Applied Psychology*, **62**: 1-16.
- Marx K. (1867 / 1930). *Capital*, J. M. Dent and Sons, London.
- Mathieu J. E. and Zajac D. M. (1990). A Review and Meta-Analysis of the Antecedents, Correlates and Consequences of Organizational Commitment, *Psychological Bulletin*, **108**: 171-194.
- Mitchell T. R. and Beach L. R. (1989). "...Do I love thee? Let me count..." toward an understanding of intuitive and automatic decision making, *Organizational Behavior and Human Decision Processes*, **41**: 1-20.
- Mobley W. H. (1977). Intermediate linkages in the relationship between job satisfaction and employee turnover *Journal of Applied Psychology* **62**: 238.

- Mobley W. H. (1982). *Employee Turnover: Causes, Consequences and Control*, Addison-Wesley, Reading.
- Mobley W. H., Griffeth R., Hand H. and Meglino B. (1979). A review and conceptual analysis of the employee turnover process, *Psychological Bulletin*, **86**: 493-522.
- Morgan G. (1997). *Images of Organization*, Sage, London.
- Morrell, K., Loan-Clarke, J. and Wilkinson, A., *Lee and Mitchell's Unfolding Model of Employee Turnover - A Theoretical Assessment*, Loughborough University Working Paper 2001.
- Morrison E. W. and Robinson S. L. (1997). When Employees Feel Betrayed: A Model of How Psychological Contract Violation Develops, *Academy of Management Review*, **22**: 226-256.
- Mossholder K. W., Bedeian A. G., Norris D. R., Giles W. F. and Field (1988). Job performance and turnover decisions: Two field studies, *Journal of Management*, **14**: 403-414.
- Mowday R.T. Steers R.M. and Porter L.W. (1978). *The Measure of Organizational Commitment*, University of Oregon, Oregon.
- Muchinsky P. M. and Morrow P. C. (1980). A multidisciplinary model of voluntary employee turnover behaviour, *Journal of Vocational Behaviour*, **14**: 43-77.
- Mueller C. W. and Price J. L. (1990). Economic, Psychological and Sociological Determinants of Voluntary Turnover, *Journal of Behavioural Economics*, **19**: 321-335.
- Pettman B. O. (1979). (Ed.) *Labour Turnover and Retention*, Gower Press, Essex.
- Pfeffer J. and Cohen Y. (1984). Determinants of Internal Labor Markets in Organizations, *Administrative Science Quarterly*, **29**: 550-572.

- Pfeffer J. and Lawler J. (1980). Effects of Job Alternatives, Extrinsic Rewards and Behavioral Commitment on Attitude toward the Organization: A Field Test of the Insufficient Justification Paradigm, *Administrative Science Quarterly*, **25**: 38-56.
- Pfeffer J. and O'Reilly C. A. (1987). Hospital Demography and Turnover among Nurses, *Industrial Relations*, **26**: 158-173.
- Porter L. W. and Steers R. M. (1973). Organizational, work and personal factors in employee turnover and absenteeism, *Psychological Bulletin*, **80**: 151-176.
- Porter L. W., Steers R. M., Mowday R. T. and Boulian P. V. (1974). Organizational Commitment, Job Satisfaction and Turnover among Psychiatric Technicians, *Journal of Applied Psychology*, **59**: 603-609.
- Price (1977). *The Study of Turnover*, Iowa State University Press, Iowa.
- Price J. L. and Mueller C. W. (1981). *Professional Turnover*, SP Medical and Scientific Books, New York.
- Price J. L. and Mueller C. W. (1981). A Causal Model of Turnover for Nurses, *Academy of Management Journal*, **24**: 543-565.
- Price and Mueller (1986). *Absenteeism and turnover of hospital employees*, JAI Press, Connecticut.
- Renn R. W. and Vandenberg J. (1991). Differences in Employee Attitudes and Behaviors Based on Rotter's (1966) Internal-External Locus of Control: Are They All Valid?, *Human Relations*, **44**: 1161-1178.
- Robinson S. L. (1996). Trust and Breach of the Psychological Contract, *Administrative Science Quarterly*, **41**: 574-599.
- Robinson S. L., Kraatz M. S. and Rousseau D. M. (1994). Changing Obligations and the Psychological Contract: A Longitudinal Study, *Academy of Management Journal*, **37**: 137-152.

- Rotter J. B. (1966). Generalized expectancies for internal versus external control of reinforcement, *Psychological Monographs*, **80**(1).
- Rusbult C. E. and Farrell D. (1983). A Longitudinal Test of the Investment Model: The Impact on Job Satisfaction, Job Commitment, and Turnover of Variations in Rewards, Costs, Alternatives, and Investments, *Journal of Applied Psychology*, **68**: 429-438.
- Salancik G. R. and Pfeffer J. (1977). An Examination of Need-Satisfaction Models of Job Attitudes, *Administrative Science Quarterly*, **22**: 427-456.
- Samuel P. (1969). *Labour Turnover? Towards a Solution*, IPM, London.
- Sayer A. (1992). *Method in Social Science: A Realist Approach*, Routledge, London.
- Sheridan J. E. (1985). A Catastrophe Model of Employee Withdrawal Leading to Low Job Performance, High Absenteeism, and Job Turnover during the First Year of Employment, *Academy of Management Journal*, **28**: 88-109.
- Sheridan J. E. and Abelson M. A. (1983). Cusp Catastrophe Model of Employee Turnover, *Academy of Management Journal*, **26**: 418-436.
- Sokal A. and Brikmont J. (1998). *Intellectual Impostures*, Profile, London.
- Somers M. J. (1995). Organizational commitment, turnover and absenteeism: an examination of direct and interaction effects, *Journal of Organizational Behavior*, **16**: 49-58.
- Steel R. P. and Griffeth R. W. (1989). The Elusive Relationship Between Perceived Employment Opportunity and Turnover Behaviour: A Methodological or Conceptual Artifact?, *Journal of Applied Psychology*, **74**: 846-854.
- Steel R. P., Shane G. S. and Griffeth R. W. (1990). Correcting Turnover Statistics for Comparative Analysis, *Academy of Management Journal*, **33**: 179-187.

- Steers R. and Mowday R. (1981). Employee Turnover and Post-decision Accomodation Processes, in L. Cummings and B. Staw (Eds.) *Research in Organizational Behavior*, JAI Press, Connecticut.
- Tang T. L., Kim J. K. and Tang D. S. (2000). Does attitude toward money moderate the relationship between intrinsic job satisfaction and voluntary turnover?, *Human Relations*, **53**: 213-245.
- Taylor M. S. Audia G. and Gupta A. K. (1996). The Effect of Lengthening Job Tenure on Managers Organizational Commitment and Turnover, *Organization Science*, **7**: 632-648.
- Terborg J. R. and Lee T. W. (1984). A Predictive Study of Organizational Turnover Rates, *Academy of Management Journal*, **27**: 793-810.
- Tett R. P and Meyer J. P. (1993). Job Satisfaction, Organizational Commitment, Turnover Intention, and Turnover: Path Analyses Based on Meta-Analytic Findings, *Personnel Psychology*, **46**: (259-293).
- Todor W. D. and Dalton D. R. (1986). Workers Stay Longer When They Have a Chance to Transfer, *Sociology and Social Research*, **70**: 276.
- Vandenberg R. J. and Nelson J. B. (1999). Disaggregating the Motives Underlying Turnover Intentions: When Do Intentions Predict Turnover Behavior?, *Human Relations*, **52**: 1313-1336.
- Youngblood S. A., Mobley W. H. and Meglino B. M. (1983). A Longitudinal Analysis of the Turnover Process, *Journal of Applied Psychology*, **3**: 507-516.
- Zenger T. R. (1992). Why Do Employers Only Reward Extreme Performance? Examining the Relationships among Performance, Pay and Turnover, *Administrative Science Quarterly*, **37**: 198-219.

Figure 1.

		Actual Turnover Type	
		Avoidable	Unavoidable
Perceived Turnover Type	Avoidable	– Fit <i>prevention orientation</i>	– Non-fit <i>spurious prevention</i> Type I error (Ho = Turnover is avoidable)
	Unavoidable	– Non-fit <i>spurious control</i> Type II error (Ho = Turnover is avoidable)	– Fit <i>control orientation</i>

Figure 2.

Focus	Measures	Characterised as
Monitor	<i>Base Rate; some context-sensitivity (e.g. national labour market, industry norm)</i>	Basic Awareness
Plan, Predict, Control	<i>Above + departmental / unit rates and targets + use of voluntariness; exit interviews; greater context-sensitivity (e.g. local labour market, competitor-aware, annual plan)</i>	Efficiency
Manage	<i>Above + leaver profiling of functionality, avoidability; high context-sensitivity (e.g. recruit / retention measures developed in ongoing dialogue with data on leavers / stayers)</i>	Effectiveness

Figure 3.

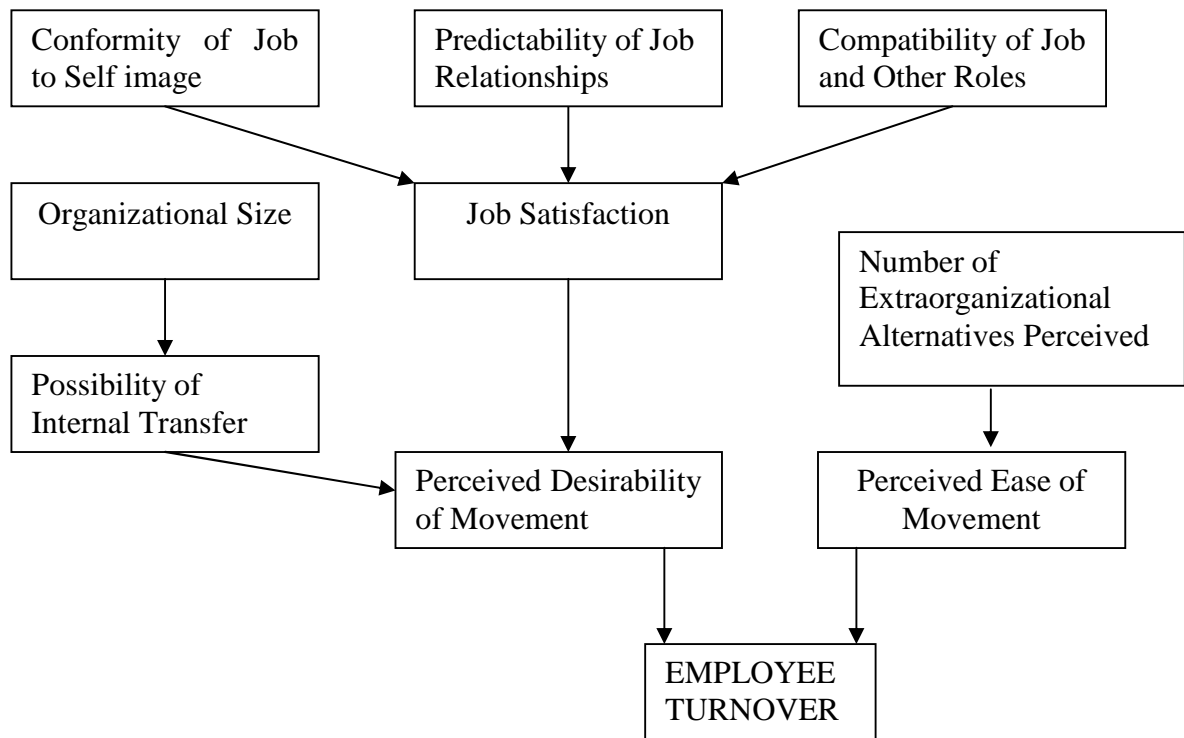
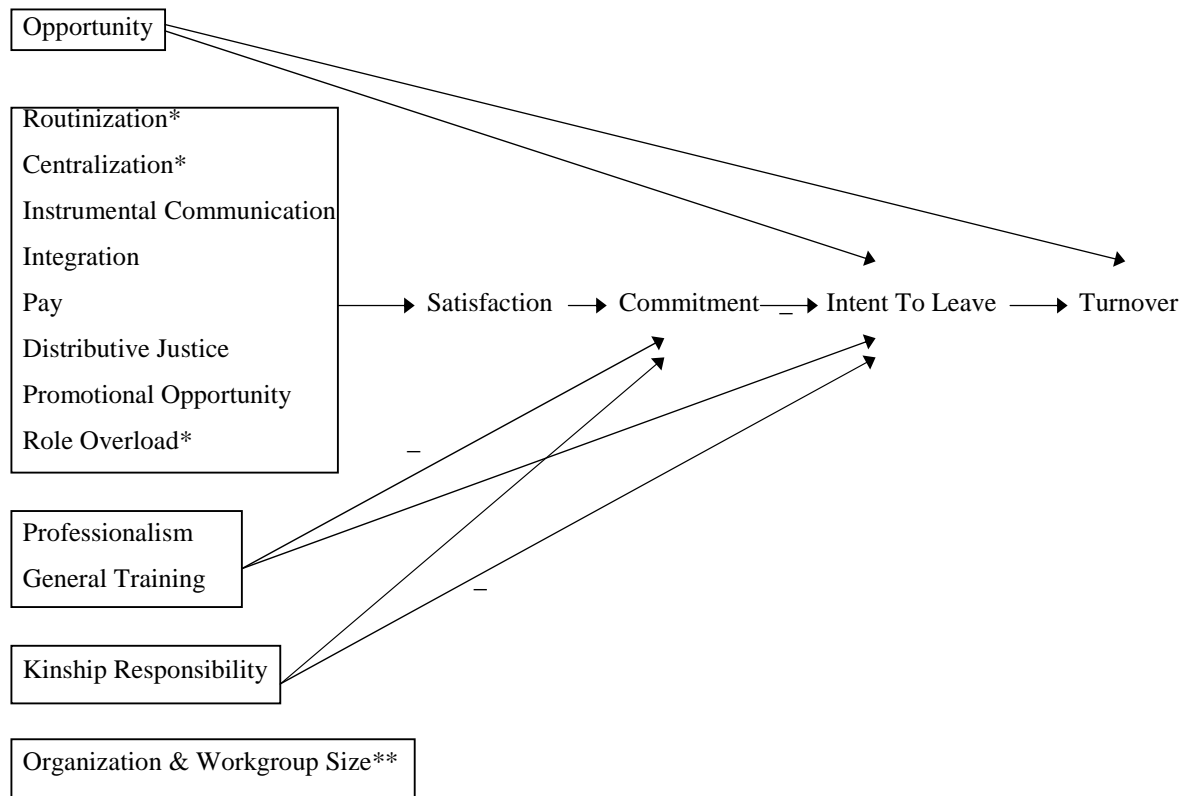


Figure 4.



Notes:

Unless signed all causal relationships (shown by arrows) are positive.

* negatively causally related

** included as an interacting (moderating) variable for analysis of routinization

Figure 5.

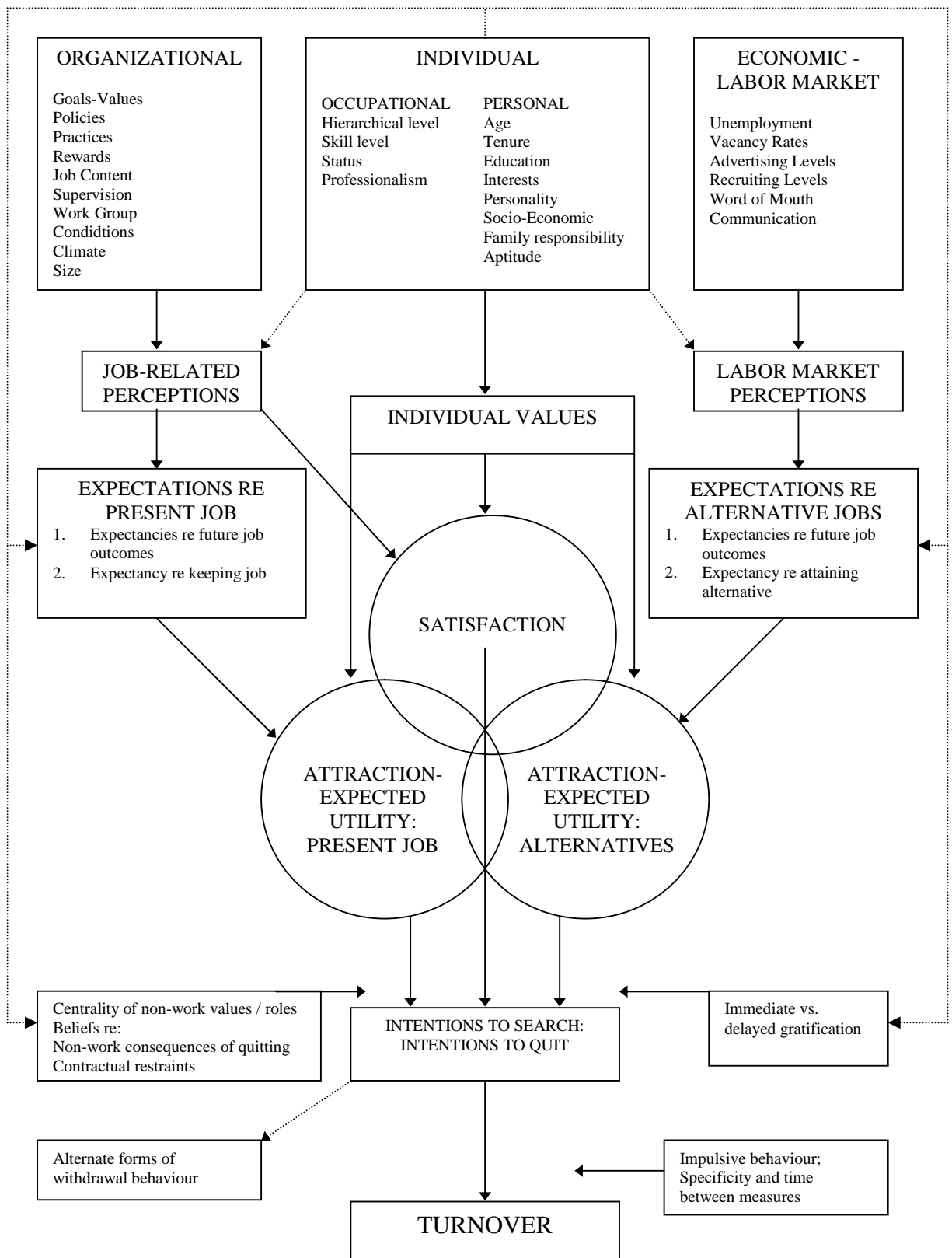


Figure 6.

