Surveys are a commonly used measurement method in organisational research. Their popularity can be attributed to their relative economy, especially when self-administered, and the ease with which they can be controlled from remote locations using mail, email or telephone. Further, surveys are the only method of observation that can describe the characteristics of a large population. This increases the likelihood of achieving a large sample, thus increasing the power of any statistical analysis undertaken using the subsequent data, increasing the likelihood of achieving statistically significant results even when analysing multiple variables, and improving the generalizability of those results.

However, surveys are not without their weaknesses. Survey respondents may experience problems with comprehension as they fail to understand what the question is asking, interpret the questions in divergent ways, experience difficulty recalling information with the desired degree of accuracy, or offer the wrong type of response as the questions fail to elicit the type of information the survey was designed to draw out. Respondents may also feel social pressure to respond in a way which is not the most honest or accurate, or they may consider the survey format cumbersome, leading them to deliberately skip items. These issues have the potential to diminish the survey instrument's reliability, its ability to yield the same findings on repeated applications, and its validity, or the extent to which it accurately reflects or assesses the concept the researcher is attempting to measure.

For these reasons the initial planning, development and testing stage of the survey design process is crucial. One technique that has become increasingly prominent when designing and developing surveys is cognitive interviewing (Beatty & Willis, 2007). Cognitive interviewing was developed by survey methodologists and psychologists to evaluate and prevent sources of error in survey questionnaires. It does so by focusing on respondent's cognitive processes as they answer survey questions; the covert, usually hidden processes as well as the overt, more readily observable processes. Cognitive interviewing helps identify response errors the respondent may commit by misinterpreting the question, failing to recall crucial information, or reporting with social desirability response bias (Desimone & Kerstin Carlson Le, 2004). Further, cognitive interviewing allows the evaluation of the overall questionnaire for structural or logical problems. This information can then be used to modify the survey instrument, reduce measurement error, and improve its validity.
In this chapter we will briefly discuss the theory behind the use of cognitive interviewing in survey development and the available techniques before demonstrating, with real data, how this approach improved an existing survey instrument designed to assess the costs of ill-health in the working population. Specifically, cognitive interviewing was used to pilot a survey instrument within a small sample of managers. By providing in-depth information and background theory about the survey being developed, and the importance of the concepts it is attempting to measure, we aim to highlight the value of using cognitive interviewing techniques during survey development. We also aim to demonstrate the value of such techniques within a management sample.

**The importance of researching cost of ill-health in employed individuals**

The economic impact of ill-health is experienced largely via indirect costs from absenteeism- and presenteeism-related lost productive time, where presenteeism denotes continuing to work while ill (Aronsson, Gustafsson, & Dallner, 2000). Lost productive time contributes significantly to estimated costs or savings in appraisal of health-care programs, cost of illness studies or cost-benefit analysis (Koopmanschap et al., 1995; Krol, Sendi, & Brouwer, 2009). Annual productivity loss attributable to poor health was recently estimated to be as high as 19.7% for workers at risk of back pain and 13.4% for those reporting impaired mental wellbeing (Riedel et al., 2009). Such estimates highlight the need for precise monetary valuation of this lost productive time.

There are two important steps to converting productivity loss into dollars; 1) quantifying the amount of lost productivity, usually as a unit of time such as days lost, and 2) the valuation of that lost time or assessment of how much it costs employers or the business. This chapter is concerned with the second step, valuation. Specifically, it focuses on how cognitive interviewing techniques can be used to assess managers' understanding of the concept of presenteeism and related lost productive time in order to improve the instrument designed to measure it.

**Limitations of existing methods**

The survey instrument evaluated in order to demonstrate the value of cognitive interviewing in this chapter, is dubbed the Team Production Interview, and was developed in response to what the authors considered to be weaknesses in the measures available to value health-related lost productive time (Nicholson et al., 2006; Pauly, Nicholson, Polsky, Berger, & Sharda, 2008; Pauly et al., 2002). Specifically, common approaches to valuing lost productive time are variants of salary conversion such as the human capital approach or friction cost methods (Drummond, Schulpher, Torrance, O'Brien, & Stoddart, 2005). Human capital values sickness-related lost productive time as equivalent to the daily wage. Friction cost methods assume productivity costs occur only in the time it takes to replace an absent or unproductive worker and restore initial production levels (Koopmanschap et al., 1995). However, neither method accounts for the variability across jobs in how output is produced (Pauly et al., 2002) or the value of that output. Valuing all employee's productivity equally, and measurable in equal units, may be inconsistent with actual output and performance indicators for each job type (Spector, 2008). For example, the applicability of these approaches to the modern labour market is disputed as the minority of workers perform discrete measurable tasks and few jobs are performed in isolation (Pauly et al., 2002).

**Key job characteristics and lost productive time: the team production approach**

The Team Production Interview (Nicholson et al., 2006; Pauly et al., 2008; Pauly et al., 2002), is based on human capital and represents an alternate means of valuing absenteeism- and presenteeism-related lost productive time. Occupation specific job characteristics including whether jobs rely on teamwork, whether workers in a particular job are difficult to replace at short notice, and whether their work output is time-sensitive (i.e. working to immovable deadlines), are considered when valuing lost productive time. Further, the cost of productivity is related to specific jobs in specific settings and involves managers in the estimation of dollar cost. Engaging managers in the generation of economic impact may improve the specificity of cost, increase the salience of evidence and thus improve their perceptions of workplace health promotion and potentially increase their intention to invest in employee health (Downey & Sharp, 2007).
A league table of 'productivity cost multipliers' by occupation are produced by the team production interview. This is achieved by multiplying the average daily wage by an occupation-specific value (a cost multiplier) in order to produce a dollar amount for a lost productive day. The cost multiplier reflects differences in replaceability, time sensitivity and team production between occupations. This approach suggests absenteeism- and presenteeism-related lost productive time costs for certain occupations may be substantially higher than those produced by standard human capital and friction costs methods (Nicholson et al., 2006). For example, the cost of a 3-day presenteeism episode for a cashier was estimated as close to the daily wage whereas estimated cost for an aerospace engineer was 142% greater than their daily wage (Pauly et al., 2008).

Difficulty valuing presenteeism-related lost productive time

Whilst absenteeism is a familiar concept and data is routinely collected by businesses, presenteeism is a fairly new concept which may be more difficult to measure and value. Unlike absenteeism, an easily understandable concept of failing to attend work when ill, presenteeism has been subject to numerous definitions. Although all definitions concern being present at work, it can be portrayed as a positive behaviour (e.g. exhibiting excellent attendance), an obsessive behavior (e.g. working elevated hours so as to be seen working even when ill), at odds with one’s health status (e.g. going to work despite feeling unhealthy), and being less than fully productive (e.g. reduced productivity at work due to health problems). Difficulty valuing presenteeism-related lost productive time has produced a failure to actively manage health-related impairment of productivity while at work (Pauly et al., 2008). The team production interview requires managers to think about the impact health conditions have on the performance of their employees in terms of absenteeism and presenteeism.

Difficulty quantifying presenteeism using self-report instruments and translating results into monetary outcomes is often attributed to a lack of confidence managers have regarding their understanding of the cognitively complex concept (Pauly et al., 2008). Greater understanding of this uncertainty can be achieved through examination of the cognitive processes underlying survey response particularly when using the four steps process model (Tourangeau, 1984). Clearly delineated steps include comprehension of the question; retrieval of the relevant information; application of said information to make a judgment if required and selecting and reporting an answer (Tourangeau, 1984). Comprehension represents a critical stage as the respondent is required to understand the question before accurately answering it (Callegaro, 2005). Most difficulties regarding presenteeism measures arise during the comprehension stage due to ambiguity surrounding the concept's meaning.

Presenteeism measurement often needs respondents to combine pieces of information at their discretion, requiring considerable cognitive effort and thus the potential to cause problems during the judgement phase of survey response (Callegaro, 2005). Additional difficulties may arise as managers' access their attitudes regarding the value of a particular employee or job type's work, necessitating the cognitively difficult task of assessing the relative importance of those beliefs and using them to form an overall judgment. Such difficulties are particularly evident amongst white collar professionals and knowledge-based professions without readily, or objectively, quantifiable work output (Koopmanschap et al., 2005) and employees engaged in a team production (Nicholson et al., 2006). Difficulties outlined may imply presenteeism cannot be measured or valued using currently available self-report methods. Attempts to do so could produce systematic bias and mis-estimation of the impact of presenteeism within difficult to assess knowledge-based occupations thus reducing the accuracy of attributed costs. Therefore, the development of a more salient, easily applicable, and interpretable, method is required.
Benefits of instrument evaluation and improvement

Evaluation and potential improvements in both accuracy and practicality of the Team Production Interview may encourage managers to use it more regularly to value absenteeism- and presenteeism-related lost productive time amongst their employees. In turn, accurate valuation could inform employers and relevant, health-care decision makers of the relative efficiency of different workplace health promotion strategies (Brouwer, van Exel, Baltussen, & Rutten, 2006). As increased productivity may compensate for the cost of an intervention precise measurement of positive health and economic outcomes are likely to be of interest to employers and may prompt them to more readily adopt workplace health promotion strategies benefiting themselves and their employees (Cooper and Patterson, 2008). Societal gains are also likely as the economy is strengthened through prevention-based investment in the health and productivity of the working-age population (Special Committee of Health Productivity and Disability Management, 2009).

Cognitive Interviewing: The Specifics

Survey researchers who apply cognitive interviewing techniques recognise they cannot know, in an absolute sense, what transpires in a respondent’s mind as he or she answers a survey question. Rather, the cognitive interviewer’s goal is to prompt the individual to reveal information that provides clues as to the types of processes mentioned above. The manner in which one may go about this is discussed.

There are two main kinds of cognitive interviewing techniques: 1) think-aloud, in which respondents are encouraged to think aloud as they provide their responses to the survey items, and 2) verbal probing, in which the interviewer “probes” into the basis or reason for the respondents answer by following the survey item with several related questions. Both techniques have their advantages and disadvantages. Think aloud techniques allow freedom from interview-imposed bias, and require minimal interviewer training. However, respondents may be resistant to this technique due to the places additional burden it places on them. It may also encourage respondents to stray from the task and bias their information processing.

Advantages of verbal probing include the additional control it affords to the interviewer during the interview process, and the ease with which respondents can be trained as the probes are often similar to the survey items they are answering. Disadvantages include the possibility of artificiality in the respondents’ answers and the potential for bias introduced by the interviewer. However, such bias can be minimized by selecting of “non-leading” probing techniques. For example, Willis (1999a) urges interviewers to probe rather than suggest possibilities to the respondents. That is, instead of suggesting the answer to the respondent e.g. "Did you think the question was asking just about physicians?", it is better to list all possibilities e.g. "Did you think the question was asking only about physicians, or about any type of health professional?".

Verbal probing is used more frequently than think aloud techniques and there are two common approaches; concurrent and retrospective. The latter is beneficial when testing self-administered questionnaires and in later stages of questionnaire development. However, concurrent probes are more commonly used. Probes can be scripted, spontaneous, or a combination of both. Scripted probes are prepared prior to the interview and ideal if there is adequate preparation time and in situations when the interviewer is inexperienced. They also allow for greater standardisation. In contrast, spontaneous probes cannot be completely planned prior to the interview and are created on the spot by the interviewer. Therefore, they are considered more disorganized and can lead to a unique, and potentially biased, relationship developed in each interview between the subject, interviewer and questionnaire.

In terms of specific categories, probes that can be used there are comprehension or interpretation probes, paraphrasing, confidence judgment, recall, specific and general probes. Comprehension or interpretation probes ask the respondent to clarify what certain items, or parts thereof, mean to them in order to identify when a respondent does not understand what the question is asking, or when the respondent has identified alternate interpretations of a question. Paraphrasing probes, which ask the respondent to repeat the questions they have been asked in their own words, are also employed for this purpose. Such probes are useful to identify which questions fail to draw out the type of information for which the survey was designed. Recall probes aim to determine which items respondents are unable to recall sufficient information to provide a precise answer to. Finally, confidence judgement probes are designed to test how sure a respondent is that they’ve provided an accurate response.
Aims

In summary, this chapter uses the results of a cognitive interviewing study, which aimed to evaluate the structure and content of the team production interview and its useability amongst managers using the aforementioned techniques, to demonstrate the use and value of such a methods. These results are also particularly novel as the study is, to our knowledge, the first evaluation of the cognitive processes underlying a cost valuation method. We explore the cognitive processes underlying managers' responses, identify difficulties and their causes and suggest design solutions to produce a more comprehensible measure of presenteeism and more reliable valuation of related lost productive time.

Methods

Sample

and recruitment

Twenty managers (12 women, 8 men) were recruited via invitations to postgraduate management students (n=6) and snowballing referral from those already enrolled (n=14). Eligibility was based on recent management experience, defined as: i) budget responsibility; ii) at least two supervisees; iii) Australian business experience; iv) occupation of a management role within the last year, for a minimum of 12 months. Most had occupied their current position for at least 2 years (M=9, SD=6.4). A variety of industries were represented and organisation size ranged from 3 to 24,000. Participation was voluntary and informed consent obtained. A sample of 20 is deemed adequate in cognitive interviewing for identifying major problems relating to survey design, structure, item interpretation and response (Willis, 2005).

Interview procedure

The Team Production Interview (Pauly et al., 2002, Nicholson et al., 2006, Pauly et al., 2008) and cognitive interviews were delivered concurrently in a telephone interview by a single interviewer, in order to ensure uniform delivery of interview items and reduce the potential for bias. The interviewer had a behavioural science background and interviewing experience. Sessions lasted, on average, 18 minutes with responses recorded by the interviewer throughout using pen and paper and word-processed immediately following the session's conclusion. The telephone based approach allowed a number of different managers to be reached in a relatively short period of time and encouraged manager's involvement by enabling participation outside work hours. The same cognitive problems were consistently reported in the first 10 interviews after which no new themes were uncovered suggesting theoretical saturation had been achieved (Weber, 1990). Additional interviews ensured the difficulties identified received sufficient coverage and to obtain a diverse range of occupations.

Measures

Team production interview

Managers completed the Team Production Interview (Nicholson et al., 2006; Pauly et al., 2008; Pauly et al., 2002) (M=18.25 mins). Interview items evaluated managers' assessments of whether key characteristics, namely degree of team production, time sensitivity of the worker's output and ease with which a perfect substitute could be sourced for the sick employee, were inherent in a nominated job type and gathered information about the structure of their department or workplace.

The telephone interview contained items addressing the following areas:

- Management Experience: gathered information regarding respondent's supervisory experience including length of time in current position and job characteristics including industry worked in.
- General Job Descriptors: collected information regarding the supervised job type nominated. Questions included "What is the average daily net wage of the relevant job type".
• Key Characteristics: included two items which separately assessed the workers replaceability during absenteeism and presenteeism episodes. Another item assessed the time sensitivity of a workers output and a fourth measured degree of team production. The measurement scaled ranged from 1 (least) to 5 (most).
• Managers’ Estimates of the Impact of Presenteeism on Inputs: contained two items measuring fewer productive hours (per 8-hours shift) a worker provided when attending work with a temporary acute condition and a chronic condition.
• Managers’ Categorical Estimates of the Impact of Absence/Presenteeism on Output: included three items separately assessing the impact of a 3-day absence and the impact of a presenteeism episode for both a temporary acute condition and a chronic condition, on the output or work of the sick worker’s team. Each item was measured on a scale of 1 (no effect) to 5 (total shutdown).

Scaling Questions
Managers estimated the cost of a 3-day absence and a presenteeism episode for a temporary acute, and a chronic condition. Payments made to sick workers are excluded. Included are costs related to lost productivity, covering for sick workers, any negative impact the illness has on co-workers productivity, sales lost due to reduced productivity and expenses to accommodate sick workers. Responses were expressed as percent of the employees’ daily wage or dollar amount. Information provided in these items was used to capture incremental costs above and beyond the lost marginal revenue product of the absent or present but sick worker, facilitating the translation of estimates into daily wage multipliers.

Cognitive interview
The cognitive interviewing technique, concurrent verbal probing, followed items (see appendix) identified (Nicholson et al., 2006; Pauly et al., 2008; Pauly et al., 2002) as difficult for participants in order to evaluate sources of response error in the questionnaires (Willis, 1999a). The interviewer immediately followed participant responses by ‘probing’ into the basis for their answer to evaluate interpretation and understanding of the original item. Scripted general probes such as, “How did you arrive at that answer?” and “Was that easy or hard to answer?” produced narrative responses for analysis and were specifically chosen to allow comparison of information collected in every interview across all respondents.

Probes used were general, as opposed to recall or specific probes, designed to encourage respondents to reveal as much information as possible about their question-answering processes including how items were interpreted and comprehended and whether there were any difficulties in doing so (Willis, 1999b). Verbal probing was selected as the process puts very little additional strain on the interviewees as the probes did not differ substantially from the question they are otherwise answering. Verbal probes aided the identification of comprehension and judgement difficulties and their proximity to the respondent’s question answering experience reduced potential recall failure and fabricated explanations (Daugherty et al., 2001). Verbal probing consistently identifies more problems with comprehension and judgement when compared to retrospective probing (Daugherty, Harris-Kojetin, Squire, & Jael, 2001; Willis, Royston, & Bercini, 1991). The immediacy of the probe to the subjects question answering experience reduces the possibility of recall failure and fabricated explanations thus improving response quality (Daugherty et al., 2001).

Analysis
Cognitive interview responses, recorded by hand during the interview, were analysed using interpretative content analysis; the repeated examination of responses and the systematic identification of recurring messages or themes the frequency of which are counted (Weber, 1990). Counting units of analysis offers a rigorous, quasi-statistical form of qualitative analysis and allows the analyst to focus on all potential problems identified, cognitive or otherwise (Willis, 2005). Descriptive analysis examined manager’s assessments of the key job characteristics to determine whether costs vary across job types (Table 2).

Analysis examined descriptive information regarding manager’s assessments of the key job characteristics to determine whether costs vary across job types according to replaceability, teamwork and time sensitivity. Descriptive statistics were produced.

Qualitative, cognitive interviewing data was subjectively evaluated by the interviewer allowing the identification of consistently problematic items relevant to the instruments replicability and validity. This facilitated the creation of future design solutions to ensure greater measurement accuracy (Willis, 2005). Although informal, these means of review allow the analyst to focus on all types of potential problems identified by respondents, cognitive or otherwise (Willis, 2005).
Results

Cognitive interviewing responses revealed consistency in the difficulties reported. Issues identified were grouped according to three themes, which repeatedly emerged during analysis (Table 1):

i) Misunderstanding of key concepts and terminology: misinterpretation of terms used in a question impeding the provision of a confident answer;

ii) Inability to provide answers due to lack of knowledge: respondents were unable to draw on experience;

iii) Difficulty applying questions/scenarios to their employee/workplace: the nature or structure of work done by selected job type or within their workplace/industry was not congruent with the question.

Table 1 presents examples of these themes, the items on which they arose and suggested modifications for future versions of this instrument.

Consistent with original findings quantitative interview results revealed managers considered some occupations harder to replace in cases of absenteeism ($M=3.7$, $sd=0.8$) and presenteeism ($M=3.4$, $sd=1.0$), more time sensitive ($M=3.3$, $sd=1.1$) and more reliant on team production ($M=2.9$, $sd=0.9$) (e.g. podiatrist) than others (e.g. store person) (Table 2). Consequently, greater productivity impacts in terms of worker input and output varied by job type. However, difficulty surrounding the evaluation of the productivity impact of chronic illness reduced the precision of these estimates.

Discussion

Using the cognitive interviewing approach allowed identification of difficulties manager’s had quantifying and comprehending, in particular, presenteeism and chronic illness items. The findings produced by these cognitive interviews lead to the modification of the survey instrument in order to address the concerns of managers. By making these changes, although not considerable, potential measurement error in future applications of the instrument may be minimised.

For example, the cognitive interviews revealed managers consistently perceived they had a lack of knowledge regarding chronic illness amongst employees and associated productivity consequences. This is potentially due to employee non-disclosure and limited organisational procedures that require organisations to monitor the prevalence of chronic illness. This lack of understanding could produce misperceptions of the impact of associated work loss and limits the interview’s application to “visible” or disclosed conditions. Alternatively, managers’ responses to chronic illness items may need to be backed up by additional interviews with employees experiencing these conditions.

Similar issues affect items estimating the impact of acute, temporary conditions albeit with a less detrimental effect on the response capability of managers. Resolution of this issue is difficult. Potential solutions such as including specific examples of conditions and severity levels may reduce the generalisability of the results and restrict their application to the example provided.
Table 1. Details and key themes emerging from cognitive interview analyses and suggested development of interview items classified by problem type.

<table>
<thead>
<tr>
<th>Original Question</th>
<th>Details of problem identified during cognitive Interviews</th>
<th>Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Misunderstanding of key concepts/terminology</td>
<td>Misunderstanding of &quot;temporary acute condition&quot;</td>
<td>Provide definition of &quot;temporary acute condition&quot;</td>
</tr>
<tr>
<td>Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hours shift does a [job type] provide if s/he has a temporary acute condition?</td>
<td>Definition of &quot;temporary acute condition&quot; unclear as evidenced by repeated reference to length of illness influencing the manager’s response</td>
<td>Provide examples of temporary acute conditions</td>
</tr>
<tr>
<td>Unable to respond accurately due to lack of knowledge</td>
<td>Misunderstanding of acute to mean severe</td>
<td>Provide a definition of &quot;acute&quot; and examples of temporary acute conditions</td>
</tr>
<tr>
<td>Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hours shift does a [job type] provide if s/he has a chronic condition?</td>
<td>Unable to respond accurately due to lack experience, to their knowledge, managing chronically ill workers</td>
<td>Add caveat: If you do not have prior experience managing chronically ill workers, please estimate to the best of your ability</td>
</tr>
<tr>
<td>Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hours shift does a [job type] provide if s/he has a chronic condition?</td>
<td>Managers not in direct service industries reported difficulties due to lack of easily quantifiable loss e.g. retail sales</td>
<td>Many admitted making an educated guess.</td>
</tr>
<tr>
<td>Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hours shift does a [job type] provide if s/he has a chronic condition?</td>
<td>Difficulties due to lack of experience managing chronically ill employees and inability to quantify lost productive time in terms of percent of wages or dollar amount</td>
<td>Overall, how much do you think it costs the firm when a person comes to work with a chronic health condition for one day, compared to the situation when the person is not sick?</td>
</tr>
</tbody>
</table>

**Miscellaneous**

Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hours shift does a [job type] provide if s/he has a temporary acute condition?

Overall, how much do you think it costs the firm when a person comes to work with a chronic health condition for one day, compared to the situation when the person is not sick?

Dependent of whether the condition was contagious or not thus affecting other workers and team production

These conditions are likely to be more affecting than chronic illnesses as they are often unexpected, symptoms are more peaked and employees have less experience managing them.

Questions relating to chronic conditions require consideration of:
- Whether conditions, and self-management practices, existed prior to employment
- Whether the worker was experience a "flare up" of the condition

Table 1 cont.

<table>
<thead>
<tr>
<th>Difficulty applying questions/scenarios to their employee or workplace</th>
<th>Overall, how much do you think it costs the firm when a person comes to work with a temporary acute condition?</th>
<th>Overall, how much do you think it costs the firm when a person comes to work with a chronic health condition for one day, compared to the situation when the person is not sick?</th>
</tr>
</thead>
<tbody>
<tr>
<td>On a scale of 1 to 5 how sensitive is a workers output:</td>
<td><strong>Difficulty answering due to involvement in project work &amp; demands regarding achievement of critical goals. E.g. whether absenteeism/preventive measures occurred during production peaks/throughout.</strong></td>
<td><strong>Cyclical or seasonal variation amongst jobs was also influential. E.g. retail assistants experiencing increased time pressure during Christmas and New Year period.</strong></td>
</tr>
<tr>
<td></td>
<td>ADD new scenario &quot;in a typical week&quot;</td>
<td>Effects of lost productivity were identifiable but work completed/output produced by the majority of specified job types was not directly quantified or costed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Managers also reported significant difficulty understanding and quantifying the impact of presenteeism for acute and chronic condition despite recognising its occurrence and demonstrating awareness of how working through illness could detrimentally effect productivity. Valuation of lost productive time costs was found to be particularly difficult for managers who did not work in direct service industries. This was likely due to a lack of easily quantifiable loss such as retail sales transacted. However, cognitive interviewing also identified that knowledge based professions experienced misperceptions of presenteeism and difficulty quantifying related productivity loss. This particular finding has significant implications as it may explain why such job types are consistently ranked as more affected by continuing to work whilst ill (Pauly et al., 2008, Koopmanschap et al., 2005). A systematic bias may arise from the influence of endogenous attitudes regarding the importance of output amongst these types of workers combined with difficulties estimating the productivity consequences of presenteeism, encouraging managers to overestimate its impact.

These issues, identified during the cognitive interviewing process, lead to the development of possible solutions and alterations to the instrument that may improve its applicability and the accuracy of the valuation estimates it produces. However, further evaluation of the instrument following their application is required to determine whether manager’s comprehension of the troublesome items is improved. Additional evaluation may determine whether the problems identified limit the team production interview to use only in conjunction with existing measures of health-related lost productive time, to both validate their findings and ensure the most accurate valuation. For example, difficulty estimating the impact of chronic illness, due to a reported lack of experience amongst manager’s, may indicate questioning employees with such is necessary.

Limitations

Three methodological limitations are worthy of note. Firstly, interviewer bias can arise when investigators probe respondents for information not initially provided. Differential reactions to the interviewer’s style can distort responses. However, the selection of fixed-word questions and open-ended, non-leading probes that employed “unbiased phrasing” (Willis, 2005) reduced the possibility of interviewer effects. Furthermore, the lone interviewer interpolated minimaly to ensure consistent presentation of interview items and cognitive probes.

Managers also reported significant difficulty understanding and quantifying the impact of presenteeism for acute and chronic condition despite recognising its occurrence and demonstrating awareness of how working through illness could detrimentally effect productivity. Valuation of lost productive time costs was found to be particularly difficult for managers who did not work in direct service industries. This was likely due to a lack of easily quantifiable loss such as retail sales transacted. However, cognitive interviewing also identified that knowledge based professions experienced misperceptions of presenteeism and difficulty quantifying related productivity loss. This particular finding has significant implications as it may explain why such job types are consistently ranked as more affected by continuing to work whilst ill (Pauly et al., 2008, Koopmanschap et al., 2005). A systematic bias may arise from the influence of endogenous attitudes regarding the importance of output amongst these types of workers combined with difficulties estimating the productivity consequences of presenteeism, encouraging managers to overestimate its impact.

These issues, identified during the cognitive interviewing process, lead to the development of possible solutions and alterations to the instrument that may improve its applicability and the accuracy of the valuation estimates it produces. However, further evaluation of the instrument following their application is required to determine whether manager’s comprehension of the troublesome items is improved. Additional evaluation may determine whether the problems identified limit the team production interview to use only in conjunction with existing measures of health-related lost productive time, to both validate their findings and ensure the most accurate valuation. For example, difficulty estimating the impact of chronic illness, due to a reported lack of experience amongst manager’s, may indicate questioning employees with such is necessary.

Limitations

Three methodological limitations are worthy of note. Firstly, interviewer bias can arise when investigators probe respondents for information not initially provided. Differential reactions to the interviewer’s style can distort responses. However, the selection of fixed-word questions and open-ended, non-leading probes that employed “unbiased phrasing” (Willis, 2005) reduced the possibility of interviewer effects. Furthermore, the lone interviewer interpolated minimaly to ensure consistent presentation of interview items and cognitive probes.
Secondly and again relating to the interview process, improvements in manager’s understanding of items and the accuracy of their responses may have been improved though the use of face-to-face rather than telephone based administration. Face-to-face interviews may have allowed observation of non-verbal cues, and provision of more natural type of interchange between the subject and the interviewer. However, telephone interviews helped ensure the time commitment required from managers was not onerous by negating the need for travel and encouraged participation by allowing completion of the interview outside regular work hours. Furthermore, a recent qualitative study comparing telephone and face-to-face interviewing revealed no significant differences between the results each method yielded (Sturges & Hanrahan, 2004).

Finally, interviews were not electronically recorded and full transcripts required to conduct content analysis using tailored qualitative analysis software (Hansen, 2006) were unavailable. However, working from hand written notes recorded during interviews is a legitimate way to compile results conferring no discernible impairment in data quality (Willis, 2005). The non-laboratory style adopted during data collection and analysis phases of this study did not impede the primary aim of exploring underlying cognitive processes of interview responses to develop potential design solutions.

In conclusion, novel application of cognitive interviewing to the Team Production Interview allowed the identification of respondent difficulties and their causes by exploring the underlying cognitive processes managers employed during survey response. Of particular note is the need to improve manager’s understanding of chronic illness and presenteeism to help ensure precise measurement and valuation of their impact in the workforce. Further development of this interview method is warranted and should occur in iterative sets involving rounds of questionnaire testing interspersed with revisions to determine whether the suggested modifications improve the instrument and reduce rates of problem identification (Willis, 2005). Continued development of new tools and methodologies, such as the team production interview, to advance the measurement of ill-health related productivity loss in the workplace is essential. Of particular importance is the development of measures in a manner acceptable to and informed by business leaders and employers to help ensure subsequent findings have easily applied, “real-world” value. More generally, the application of cognitive interviewing techniques in piloting can substantially benefit research studies that involve self-report data such as questionnaires and surveys.

References


Appendix: Team Production Interview

1. Management experience:
   a. Do you have any management or supervisory experience?
      Yes
      No
      If yes: Approximate total experience?
      _______ years _______ months
   b. Does your current position have management responsibility?
      Yes
      No
      If yes: Approximate number of staff you are responsible for.
      _______
      Approximate level of budget you control.
      _______
      Approximate length of time in position.
      _______ years _______ months
   c. Please indicate your current employment status:
      Full-time
      Part-time / Contract
      Casual
      Not currently employed
   d. Please indicate which industry you work in:
      Accommodation & Food Services
      Manufacturing
      Administrative & Support Services
      Mining
      Agriculture, Forestry & Fishing
      Professional, Scientific & Technical Services
      Arts & Recreation Services
      Public Administration & Safety
      Information, Media & Telecommunications
      Rental, Hiring & Real Estate Services
      Construction
      Retail Trade
      Education & Training
      Transport, Postal & Warehousing
      Electricity, Gas, Water & Waste Services
      Wholesale Trade
      Financial & Insurance Services
      Other
      Health Care & Social Assistance
1e. Please indicate the highest level of education you have completed.

Up to year 10
Year 12
Trade Qualification
Associate Diploma/Certificate
Undergraduate degree
Graduate Diploma/Certificate
Masters/MBA
PhD
Other __________________

2. General job descriptors [___] (Supervised Job Type)

2a. Job type/title: ________________________________

2b. Number of employees of that job type that you supervise: 

2c. Total number of employees in your organisation in all jobs: 

2d. Average daily net wage of the relevant job type: $1______

2e. Average number of absence days per employee per year for this particular job type: ___

2f. Average number of scheduled working days per year: ___

[Prompt: For example, in a full time job, with four weeks annual leave, there are 240 scheduled work days per year not including flex time, public holidays].

3. Key characteristics

The next set of questions asks about the nature of the work done by [job type], and the implications for the productivity of your team if your [job type] is sick. We will ask you separately about what happens if they come into work when they are sick and what happens when they take a day off work.

3a. On a scale of 1 to 5, how easy is it to have a co-worker or an outside temp worker pick up the most important responsibilities of the worker who is at work but sick, where:

1 2 3 4 5
Easy to pick up the responsibilities with similar quality
Impossible to pick up the responsibilities

[Prompt: "1" means there is a pool of workers you can access whenever you want and these workers can take on the key tasks of the sick workers and perform them just as the sick worker would have if he/she had been healthy. "5" means there is nobody else you could possibly find who could take on the key tasks from the sick worker and do them just as well.]

3b. On a scale of 1 to 5, how easy is it to have a co-worker or an outside temp worker pick up the most important responsibilities of the worker who is absent for the entire day because of illness, where:

1 2 3 4 5
Very easy Not at all easy

3c. On a scale of 1 to 5, how time sensitive is this worker’s output, where:

1 2 3 4 5
Work can be postponed easily Work cannot be postponed without severe consequences

[Prompt: For example, "1" means that the worker can complete his or her work the following day and no sales are lost and no important deadlines are missed. "5" refers to a situation where sales would be lost and/or important deadlines missed if a worker were absent or present for work but sick.]

3d. On a scale of 1 to 5, how important is this worker to the function of her/his team, where:

1 2 3 4 5
Team can function as usual when the worker is absent or present but sick Team cannot function when the worker is absent or present but sick

[Prompt: For example, a "1" might be appropriate for a person who picks crops in a field all by himself, and a "5" might be appropriate for the conductor of an orchestra where the orchestra can’t play without the conductor and the conductor is useless without the orchestra.]
4. Managers' estimates of impact of presenteeism episode on inputs

4a. Now I want you to think of when your [job type] has a temporary acute condition such as a headache, cold/flu, or hay fever. Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hour shift does a [job type] provide if she/he has a temporary acute condition? ___ hours

4b. Now think of when your [job type] has a chronic health condition such as asthma, diabetes, or depression. Compared to a worker who is perfectly healthy, on average, how many fewer productive hours per 8-hour shift does a [job type] provide if she/he has a chronic condition? ___ hours

5. Managers' categorical estimates of the impact of absence/presenteeism on output

5a. Consider a situation where a [job type] becomes unexpectedly ill and misses 3 days of work. On a scale of 1 to 5, what impact would this 3-day absence have on the output or work of the absent worker's team [or the other people the manager supervises if the ill worker does not work in a team]? 1 2 3 4 5

No effect at all Total shutdown

5b. Now think about what happens to the overall productivity of the ill worker's team [or the other people the manager supervises if the ill worker does not work in a team] when one of the workers is at work with a temporary acute health condition. What impact would the presence of this sick worker have on the output or work of the sick worker's team [or the other people the manager supervises if the ill worker does not work in a team]? Please use a scale of 1 to 5.

1 2 3 4 5
No effect at all Total shutdown

5c. Now think about what happens to the overall productivity of the ill worker's team [or the other people the manager supervises if the ill worker does not work in a team] when one of the workers is at work with a chronic health condition. What impact would the presence of this sick worker have on the output or work of the sick worker's team [or the other people the manager supervises if the ill worker does not work in a team]? Please use a scale of 1 to 5.

1 2 3 4 5
No effect at all Total shutdown

6. Scaling questions

6a. Earlier you said that these workers are paid about $____ per day. Overall, how much do you think a one day absence by this worker costs the firm, in terms of additional costs the firm incurs or sales lost due to the absence? Do not include any payments made to the absent worker. Please try to estimate, as best as you can, how much an absence of this type of worker costs the firm in terms of their daily wage. % of daily wage [_____] OR dollar amount $[_____]?

6b. Earlier you said that these workers are paid about $____ per day. Overall, how much do you think it costs the firm when a person comes to work with a temporary acute health condition for one day, compared to the situation when the person is not sick? Costs include the value of the lost productivity, covering for the sick worker, any negative impact the illness has on the productivity of other workers you supervise, any sales lost due to reduced productivity, and any expenses to accommodate the worker's condition. % of daily wage [_____] OR dollar amount $[_____]?

6c. Earlier you said that these workers are paid about $____ per day. Overall, how much do you think it costs the firm when a person comes to work with a chronic health condition for one day, compared to the situation when the person is not sick? Costs include the value of the lost productivity, covering for the sick worker, any negative impact the illness has on the productivity of other workers you supervise, any sales lost due to reduced productivity, and any expenses to accommodate the worker's condition. % of daily wage [_____] OR dollar amount $[_____]?