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Abstract

Job-related burnout in information technology professionals is seen as a serious issue for organizations and individuals. While the substantial body of research on job stress and burnout can provide valuable insights into the prevention of burnout in IT as well as interventions, we argue that drawing upon this work should be done with caution. In particular, generalizability of the learnings beyond the occupations studied (predominantly people-oriented and/or caregiving roles) cannot be assumed. As a first step toward assessing the applicability of existing burnout research to IT, the purpose of the study described in this paper is to understand how IT professionals make sense of and assign meaning to burnout in the profession. The study uses an approach based on social representations theory, which was first formulated by French social psychologist Serge Moscovici. Social representations are defined as the shared images and concepts through which we organize our world. Transcripts from in-depth interviews of 20 IT professionals were content-analyzed and 22 key topics (concepts) identified. Quantitative methods (including analysis of similarity and analyses to determine the relational structure of the concepts) were used to create a social representations map of these professionals' understandings of burnout. The map provides preliminary evidence of elements that are central/peripheral to those understandings, pointing to implications for the applicability of existing theory on burnout as well as priorities for future research.

Keywords: Burnout, job stress, IT professionals, social representations theory

Introduction

They recruited him; he had fine credentials. Then, of course, everything went sour for him….He went to work at Special Systems, and in his first year there, he was assigned so many important, challenging projects that he not only forgot to take his vacation, he also failed to take a weekend off.…"When you burn out, you lose enthusiasm. I always loved computers. All of a sudden I just didn't care. It was, all of a sudden, a job"….On

> this occasion, he went away from the basement and left this note on his terminal: *I'm going to a commune in Vermont and will deal with no unit of time shorter than a season.*
>
> *The Soul of a New Machine* (Kidder 1981, p. 217)

The experiences of a young software engineer captured in Tracy Kidder's classic account of the efforts to create the first 32-bit super-minicomputer remind us that burnout is not a new phenomenon in the information technology profession. There are, however, indications that burnout in IT has become increasingly pervasive. A recent study by the technology advisory firm Meta Group reports that 71 percent of IT managers surveyed believe that employee job burnout is a serious problem for their company (Hayes 2003), and burnout has become a common topic in practitioner journals (e.g., King 1995; McGee et al. 2000). Recognition of the individual and organizational costs that this severe form of job strain can entail has drawn researchers to this topic, with an estimated 2,500 papers on burnout published over one 20-year period (Schulz et al. 1995). While much progress has been made on defining and measuring burnout, identifying correlates and understanding its development (for a review, see Cooper et al. 2001), applicability of this work to the IT profession remains an open question. An underlying assumption of much of the extant theory is that burnout occurs in people-oriented and/or caregiving roles (e.g., nursing, social work, teaching, law enforcement). Whereas some IT-related jobs (e.g., help desk support) are people-oriented, many IT jobs are not. Indeed, for many IT professionals, as for the software engineer above, interaction with software and hardware is more central to their work than interaction with other people. As IS researchers, it is common practice to draw theory and insights from reference disciplines (Benbasat and Weber 1996; Vessey et al. 2002). In the case of burnout in IT, however, we contend that it is unwise to draw upon the burnout literature without first gaining a better understanding of *burnout as it is understood and experienced specifically within the IT profession*. To that end, the purpose of the exploratory study described in this paper is to (1) understand how IT professionals view burnout in the context of their work, and (2) identify implications for future research on burnout in IT grounded in that understanding. For the study, we used a social psychology/social cognition approach based on social representations theory (Moscovici 1981) to capture and analyze the perspectives of 20 IT professionals on burnout. Data was collected via in-depth interviews and content analyzed to generate a social representation map of the participants' understandings of burnout in the profession. The map reveals several key issues and understandings concerning burnout in IT, pointing to high priority areas for future research. Analysis of the map also provides preliminary evidence concerning the generalizability of current theory on burnout to IT jobs.

Research on Burnout/Work Exhaustion in IT Professionals

What is known about burnout in the IT profession? A review of the academic literature reveals that burnout has been a topic of interest since at least 1983 (Ivancevich et al. 1983; Weiss 1983). Examples of more recent studies are Moore's (2000) investigation of the primary causes of work exhaustion and the relationship between work exhaustion and turnover intentions; a study by Sethi, Barrier and King (1999) examining correlates of burnout with role ambiguity and role conflict (antecedents), and two dimensions of organizational commitment—affective and continuance (consequences); and Lim and Teo's (1999) study to identify key sources of stress in IT work. Valuable insights have been gained in these and other studies; however, our understanding of burnout in IT currently is limited by *sparseness* in terms of number of studies (our review identified fewer than 20 studies over the past two decades), and *fragmentation* in terms of the diversity of topics investigated and learnings.

Additional factors that present challenges to the development of a more comprehensive cumulative body of knowledge on burnout in IT are (1) the use of different instruments, based on different conceptualizations, to measure burnout; (2) lack of a standard definition of the jobs that comprise *IT profession*, as well as the diversity of those jobs and changes in jobs/work over time; (3) changes in the work environment that may impact the source and severity of stressors for IT workers (e.g., pace of technology change, IT offshore outsourcing); and (4) dependence upon general organizational behavior theory which may or may not be generalizable to IT workers. As a consequence, management guidance in this area is fairly limited. Our research objective is to outline a program of research directed specifically toward the IT profession, focused on areas of high priority need. The goal of the current study is to identify key areas of need that will provide a foundation for framing this research program.

Job-Related Burnout: Theoretical Perspectives

Job burnout is an extreme and specific manifestation of job-related strain, and is a long-term consequence of stress in the workplace (Burke et al. 1996; Cooper et al. 2001; Maslach 1999). The general model of stress and its relationship to burnout used for this research is shown in Figure 1. The model is based on the *transactional* view of stress as a dynamic cognitive state
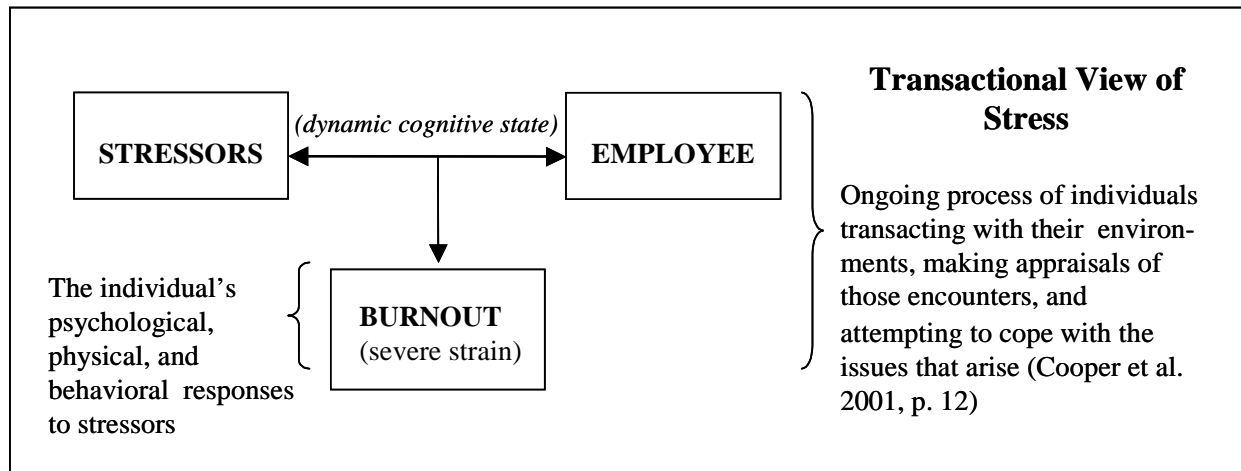
Figure 1. General Model of Stress (Transactional View) and Burnout

resulting from individuals transacting with the environment, and appraising and coping with the demands that arise (Dewe et al. 1993; Lazarus 1991). Stress occurs when the individual perceives that the demands of the environment exceed or tax the resources available, threatening their well-being (Lazarus 1991). Strain, then, is defined as the individual's psychological, physical, and behavioral responses to stressors. Burnout is severe strain—"an extreme state of psychological strain and depletion of energy resources arising from prolonged exposure to stressors that exceed the person's resources to cope" (Cooper et al. 2001, p. 84). Empirical evidence linking burnout to turnover, absenteeism, reduced productivity and various human considerations points to the substantial costs of burnout for both individuals and organizations (Cordes and Dougherty 1993).

One of the challenges that research on burnout presents is the number and variety of definitions of this concept (for summaries, see Burke and Richardsen 1993; Cordes and Dougherty 1993). Because some conceptualizations provide a better *fit* to particular types of work, the choice of a definition for research on burnout in the IT profession is an important issue. The most widely accepted model of burnout is the three-component conceptualization developed and elaborated by Maslach and her colleagues (Maslach 1982; Maslach 1998; Maslach et al. 1996). Early work by Maslach, one of the primary contributors to this area of study, defined burnout as "a syndrome. . .that can occur among people who do 'people work' of some kind." (1982, p. 1) The original model focused on occupations where workers have extensive interaction with other people. The three dimensions of that model are (1) emotional exhaustion, (2) depersonalization (treatment of others in the workplace as objects rather than people), and (3) (reduced) personal accomplishment. Subsequently, a more general model intended for applicability to a broader range of occupations was developed (Maslach et al. 1996). The corresponding components in this model are (1) exhaustion, (2) cynicism (a distant attitude toward the job), and (3) reduced professional efficacy. There has been considerable debate concerning two of the dimensions in these models: depersonalization (or cynicism) and reduced personal accomplishment (or reduced professional efficacy). An alternative perspective, one that is gaining support in the research community, views emotional exhaustion as the core element of burnout and suggests that the other two dimensions are separate, but related, variables (e.g., Koeske and Koeske 1993; Lee and Ashforth 1996). In practice, however, it is still common for instruments based on the three-component view (the MBI [Maslach Burnout Inventory] and MBI-GS [General Survey]; Maslach et al. 1996) to be used in burnout research, thus reinforcing this conceptualization of the construct (Cooper et al. 2001).

Social Representations Theory

Social representations theory provided the basis to capture and analyze the perspectives of IT professionals on job-related burnout. The theory of social representations was formulated by French social psychologist Serge Moscovici and his associates (Farr and Moscovici 1984; Moscovici 1961/1976, 1981). The theory has roots in Durkheim's (1912/1995) distinction between collective and individual representation. It is an approach that links macro-level social discourse with individual social behavior, cognition, affect, and symbolic understanding (Wagner et al. 1996). Social representations can be defined as commonsense knowledge about general topics (in this case, burnout) that are the focus of everyday conversation (Lorenzi-Cioldi and Clemence 2001). Formed through discursive practices, social representations are the shared images and concepts through which we organize our world (Parker 1987; Wagner et al. 1996). While social representations theory has been used to understand commonsense knowledge

in the larger society about topics such as intelligence, mental illness, gender, and violence, the theory and related methods can also be used as a tool for the analysis of organizational cognition. (For a comparison of causal mapping and the construction of social representation maps as methods for capturing and analyzing organizational cognitions, see Nicolini 1999.) In this study, our goal was to capture the social representations of burnout of the members of an occupational group: IT professionals. A key advantage offered by this approach is that it allowed us to discover those perspectives as they are understood within the profession rather than biasing the exploration toward current theoretical conceptualizations.

A fundamental hypothesis of social representations theory relates to the structure of representations, which are seen as consisting of a *central core* and *peripheral elements* (Abric 1976). The central core, or attitudinal component, is the most resistant to change: "It constitutes the most stable element of the representation, the one that ensures the perennial nature of the representation in moving and evolving contexts" (Abric 2001, p. 44). The core provides a "generating function" through which the other elements of the representation acquire meaning and value (Abric 2001). Peripheral elements are organized around the central core. These are the area of adaptation based on new information or transformation of the environment. One of the functions of peripheral elements is to act as a defense system, or shock absorber, because they may change without disturbing the central core (Flament 1994). Effective transformation of a representation, then, is only possible if the central core itself is questioned (Moliner 1992). For this study, we adopted a structural approach to identifying and analyzing social representations. The objective of the method described in the following section was not only to identify the elements of the social representations of burnout and their relationships, but also to identify the shared meanings of burnout that are part of the central core.

Method

Abric (1994) identified two distinct methodological issues relevant to any study involving analysis of social representations: (1) collection of social representations and (2) analysis of the data obtained to elicit structure of social representations.

Table 1. Participant Summary

Job titles:		Years experience in IT:	
1	System administrator	2	less than 5 years
4	System analyst/senior programmer analyst/senior systems architect	8	between 5 and 10 years
1	Senior network planning engineer	2	between 10 and 15 years
3	IT project manager/E-commerce project lead	4	between 15 and 20 years
2	Section manager/integrated marketing manager	4	between 20 and 25 years
2	Senior consultant/IT management consultant		
5	Vice president of IT services/manager of information services/manager of support services/director of IT	**Age:**	
		3	under 30
2	Instructor/doctoral student	6	30 – 39
		11	40 – 49
		Gender: 10 men/10 women	
Industry:		**Employees in the organization:**	
5	Software	3	less than 100
3	Telecommunications	6	between 100 and 1,000
3	Government/military	6	between 1,000 and 10,000
3	Higher education	5	over 10,000
2	Healtcare/insurance billing		
1	Chemical process	**IT professionals in the organization:**	
1	Manufacturing	3	less than 10
1	Transportation	6	between 10 and 50
1	Legal	5	between 50 and 100
		1	between 100 and 500
		5	over 500

Eliciting Social Representations

Farr and Moscovici (1984) recommend the analysis of interview transcripts as one data collection method to elicit social representations. Because this was an exploratory study, the goal was to understand the social representations of burnout of IT professionals from diverse work settings, types of IT jobs, and levels of responsibility. Study participants were solicited from IT professional organizations and user groups (e.g., ACM and IEEE SIGs, AITP, Linux user groups, Oracle users groups). Leaders of local chapters of these organizations were contacted and asked if they would forward an e-mail to their membership requesting volunteers to participate in the study. As a result of one of those contacts, the request for participation in the study was also published in the online newsletter of Women in Technology International (WITI) (http://www.witi.com/). The request gave a brief description of the topic and purpose of the research and stated that we wanted to interview IT professionals who had either (1) experienced work-related burnout themselves or (2) observed situations where other IT professionals had experienced burnout. To avoid biasing the input, the solicitation request did not explain what we meant by the term *burnout*, nor were any examples of burnout situations given. Solicitation of study participants continued until adequate diversity in terms of job types and work settings was achieved.

A total of 20 people participated in the study. Participants first completed a web-based form with questions about their IT work experience and demographic information. (See Table 1 for a participant summary.) Eighteen participants were practicing IT professionals, and two were currently in careers in academia but had extensive prior work experience in the IT field. Data was collected via telephone interviews. The interview format was semi-structured. Using an interview guide (including main questions and probes), subjects were asked to describe, in detail, a specific case of burnout they had experienced or observed; to define burnout; to identify causes of burnout in IT; and to recommend ways to prevent burnout. Interviews averaged 30 minutes in length and were tape recorded and transcribed.

Mapping Social Representations

Coding

The first step in the analysis process was detailed coding of the interview data. *Atlas.ti* software was used to manage and organize the results of the coding. Transcripts were coded by the first author using an open coding processes (i.e., codes were not pre-determined, but rather emerged from the data). For example, five codes were assigned to the following transcript segment:

> Acquisition [*of another company*] is very stressful because you really don't get additional resources to handle it. You have to just fit it into your regular day-to-day work. So, not having all the proper skills….we hadn't really had a large acquisition. That was our first time. We didn't know how to do it. So a lot of it was trial and error. And then there was a lot of stuff just dumped on us, too…unrealistic due dates.…Just to make it happen regardless of what. And as an IT professional you want to do things the right way. (Subject # 3 – Manager of Information Services)

Assigned codes were SI-2 Company growing fast/acquisition of new company; SW-19 Extra work in addition to regular work; SW-10 No prior experience with this type of project/doing by trial and error; SW-7 Unrealistic deadlines; SP-7 Want to do things the right way. A total of 108 detailed codes were identified during the coding process. A second coder, an MBA student, then independently re-coded the interview transcripts using this set of codes. Inter-coder agreement, based on presence or absence of codes in each of the interviews was 77.8 percent. The second step in the coding process was to group related codes. Output of this roll-up step was the set of 22 topics show in Table 2.

Quantitative Analysis

In order to elicit the underlying structure of social representations, we employed a two-step analytical procedure, known as *analysis of similarity*. We further conducted a battery of quantitative tests to explore what elements might comprise the central core of the representation. Introduced by Flament in 1986, analysis of similarity has become a widely used technique to discover relationships among the elements of shared representations (Calafat et al. 1998; Degenne and Verges 1973; Nicolini 1999). Its fundamental assumption is that the relative position of elements within a representation is reflected in the degree of agreement that members of a group display with respect to these items. In other words, the more frequently subjects use the items (themes) together, the closer those items will be in the social representation. Agreement, therefore, is operationalized as co-occurrence of attributes (i.e., thematic codes) across sources (i.e., interviews).

Table 2. Topics (Concepts)

|	**Topic Description/Example Quote**
Topic 1	Working long hours over extended period of time/heavy workload "And when I did try to cut back because I needed some personal time, it was like, 'Wait a minute. You've now raised the bar. We expect you to put in these hours and you can't go back.' I was like, 'Wait a minute. I need to be able adjust that.' And so there was that mentality."
Topic 2	Leave the job/leave the profession "What I'd I say is sad is that I've seen a lot of people leave. They've said, 'I've had it. I'm not working in IT anymore.' I've seen a lot of people jump out of it and say 'It's not for me anymore.'"
Topic 3	Project Issues: selection, prioritization, planning, management, deadlines, problems "I can't tell you how many projects I've seen where the end date was the first thing that was set. 'We're going to do this, and this is when we're going to complete it.' They have no idea what work is involved to complete that task."
Topic 4	IT management/supervision: actions, skills, effectiveness "They [*IT managers*] were technical people themselves and I think once they get into that management mode that they're trained to be that 1950's…whatever you want to call it…but that style of manager that is like every other manager. Whereas I think within IT you need a different type of management to recognize the burnout, to keep the motivation going or to remotivate people."
Topic 5	Competitive business environment/company survival "We were in a very growth mode and we were IT, which is changing. And we're telecom, which is changing….Because the telecom industry used to be very smooth. It didn't have a lot of changes. Well, now we have FCC changes, PUC changes. We have competition. We have the walls going down. We're not going to be a monopoly anymore. That it's just everything that you've known about your business is changing."
Topic 6	Corporate culture/values/ethics "I've noticed a lack of ethics….Overall general business ethics, professional ethics deteriorated as everything became much more competitive. And a desperation of survival kind of crept into everything that was done on a daily basis."
Topic 7	Relationships between work/personal life "Actually, I think it [*extended work hours*] affected my girlfriend more than it did me….that kind of affects me after awhile."
Topic 8	Interpersonal Issues: friction/conflicts with colleagues, users, etc. "And frontline support because they get abused. Users are rude, they're angry. Not that I've never been an angry user myself but you'll just feel downtrodden. And every mistake you make is right in the public eye."
Topic 9	Detrimental to physical well-being/physiological impacts "And then there are just the health issues of just trying to do too much. You know, you don't take time to exercise, you don't take time to take care of yourself. I've just been frightened how many people have gone in here for stress tests lately. And that's scary."
Topic 10	Emotional strain/negative emotions (e.g., depression, anger)/emotional support "People will just blow up and loose it emotionally….It's like they don't know what's wrong but they're really upset about something….Like at the end of big projects where people just have been working 20 hours a day, for like weeks, and then toward the end of that they just can't deal with anything."
Topic 11	Mental capabilities impaired "And communication breaks down because you can no longer put together complete sentences. And we got frustrated with each other because I'd have to repeat myself four times, and I'm not very patient with repeating myself several times. But it was just because at some point he got so burnt out that he could no longer really comprehend what I was saying. And it was something he knew cold."
Topic 12	New behaviors: withdrawal/avoidance, doing things out of character "Other people just kind of become reclusive and don't want to talk to anybody."

	Topic Description/Example Quote
Topic 13	Lack of fit: person/job "The type A people, the aggressive type of people….I can see those people burn out sooner. So what happens is those people are aggressive, they're fast paced. Historically from what I've seen, IT involvement can't be that. You know, some of these projects take many million dollars and many, many years to get done. So it's not really a fast-paced environment."
Topic 14	Bad job market/lack of job security "Two years ago, pretty much any of us could have said, 'Well, I'm going out and get a job'….Now it's tough all over. So people will put up with a lot more. They'll burnout in place but they'll still work. They'll do what I've heard said is the 51-percenter....They're doing just enough that they're not being disruptive or they're not being a drag. But they're also not contributing more than staying in place."
Topic 15	Multiples: projects/tasks, clients, locations, responsibilities "And sometimes you find you're constantly switching gears and not really accomplishing very much... Like I'm just juggling balls. I hit a point where I just say, 'Enough.' Then I just sort of drop them all and then pick them up one at a time."
Topic 16	Job performance: negative impacts "Work quality definitely suffers. If you're trying to do something that takes nine months in four months, you know, just by putting more people and putting more hours, you just cannot get the work done the same way you would want it to get done."
Topic 17	Want to do things "right" "He just couldn't handle not doing something a hundred percent perfect."
Topic 18	Development of burnout over time/employee's lack of awareness "And until there was some relief given, it just progressively got worse."
Topic 19	Skills Issues: lack of skills/experience, constant need to retool "And it's extremely important to me to know what's going on. To pick up a magazine, to read, to go to seminars. It's a really big part of the job that really doesn't count as on-the-job time. It keeps you pretty stressed. That's the nature of the business."
Topic 20	Boring, repetitive work "It's getting tired of the same thing day after day."
Topic 21	Pressures due to organization's dependence on IT "The pressure is that we have to provide support now—where we used to do it 9 to 5, we have to provide support 24 hours a day because we have salesmen out the field with mobile devices that need to acquire data, need to do things and have to be able to respond."
Topic 22	IT work lacks elements of some other kinds of work that contribute to job satisfaction "Especially when you do a database, there's nothing to stand back and really physically look at. I know what it all looks like in my head. I can print out a chart of the E-R model. You can show the E-R model in that way, but to me it's not a tangible thing. I've done, even before I went to college, a lot of carpentry and that type of thing. And it was always nice to stand back and admire what you did."

In step one of the analysis of similarity, the source-by-attribute data matrix obtained from the content analysis was transformed into the inter-attribute similarity (IAS) matrix (see Table 3). Each cell of the IAS matrix contains a Jaccard's similarity coefficient, indicating a degree of co-occurrence (proximity) for a given pair of attributes (Hammond 1993). In step two of the procedure, significant relationships among the elements of the representation were identified by constructing the *maximum tree* of the system based on the pair-wise similarity indexes from the IAS matrix. Flament's (1986) notion of the maximum tree in this case is equivalent to the minimum spanning tree concept originating in graph theory (Doise et al. 1993, p. 33). Minimum spanning trees search for the shortest path to connect all nodes within a graph in such a way that there is only one link between any two nodes. In the context of the social representations theory, Flament's maximum tree seeks to single out those relationships among the elements that maximize the overall similarity within the representation. In order to construct the maximum tree, the nearest neighbor algorithm was run on the IAS matrix; absolute frequencies of themes' appearance were used to break the ties (Kruskal 1956). The resulting social representation map is presented in Figure 2. It is important to point out that according to the graph theory convention, the map in Figure 2 does not reflect the 'actual' location of the elements in the representation. Rather, it serves merely as an illustration of the pattern of significant relationships among the major themes.

Table 3. Inter-Attribute Similarity Matrix

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	T16	T17	T18	T19	T20	T21	T22
T1	1.000	0.632	0.722	0.650	0.333	0.333	0.474	0.667	0.611	0.833	0.529	0.500	0.333	0.421	0.412	0.789	0.412	0.412	0.294	0.167	0.588	0.158
T2	0.632	1.000	0.474	0.579	0.500	0.400	0.471	0.500	0.529	0.579	0.278	0.333	0.235	0.412	0.313	0.632	0.313	0.313	0.357	0.286	0.500	0.188
T3	0.722	0.474	1.000	0.667	0.400	0.313	0.389	0.688	0.529	0.579	0.353	0.500	0.313	0.412	0.400	0.550	0.400	0.313	0.267	0.059	0.600	0.188
T4	0.650	0.579	0.667	1.000	0.353	0.353	0.588	0.611	0.474	0.600	0.389	0.444	0.278	0.368	0.278	0.650	0.438	0.438	0.167	0.111	0.444	0.235
T5	0.333	0.500	0.400	0.353	1.000	0.556	0.286	0.429	0.357	0.278	0.143	0.308	0.167	0.308	0.273	0.263	0.400	0.273	0.333	0.000	0.308	0.091
T6	0.333	0.400	0.313	0.353	0.556	1.000	0.385	0.429	0.357	0.353	0.231	0.308	0.273	0.308	0.077	0.333	0.167	0.167	0.200	0.100	0.308	0.091
T7	0.474	0.471	0.389	0.588	0.286	0.385	1.000	0.412	0.353	0.421	0.333	0.235	0.286	0.400	0.286	0.474	0.286	0.286	0.067	0.154	0.313	0.067
T8	0.667	0.500	0.688	0.611	0.429	0.429	0.412	1.000	0.471	0.611	0.294	0.643	0.333	0.438	0.429	0.579	0.250	0.429	0.286	0.063	0.643	0.125
T9	0.611	0.529	0.529	0.474	0.357	0.357	0.353	0.471	1.000	0.647	0.500	0.375	0.118	0.467	0.267	0.526	0.357	0.267	0.133	0.143	0.375	0.133
T10	0.833	0.579	0.579	0.600	0.278	0.353	0.421	0.611	0.647	1.000	0.563	0.625	0.353	0.368	0.353	0.833	0.278	0.353	0.313	0.176	0.529	0.167
T11	0.529	0.278	0.353	0.389	0.143	0.231	0.333	0.294	0.500	0.563	1.000	0.357	0.231	0.118	0.231	0.529	0.333	0.333	0.077	0.083	0.267	0.077
T12	0.500	0.333	0.500	0.444	0.308	0.308	0.235	0.643	0.375	0.625	0.357	1.000	0.308	0.176	0.417	0.500	0.133	0.417	0.364	0.000	0.538	0.071
T13	0.333	0.235	0.313	0.278	0.167	0.273	0.286	0.333	0.118	0.353	0.231	0.308	1.000	0.214	0.273	0.333	0.077	0.273	0.333	0.222	0.308	0.200
T14	0.421	0.412	0.412	0.368	0.308	0.308	0.400	0.438	0.467	0.368	0.118	0.176	0.214	1.000	0.133	0.350	0.214	0.133	0.154	0.273	0.250	0.364
T15	0.412	0.313	0.400	0.278	0.273	0.077	0.286	0.429	0.267	0.353	0.231	0.417	0.273	0.133	1.000	0.333	0.273	0.400	0.333	0.000	0.545	0.000
T16	0.789	0.632	0.550	0.650	0.263	0.333	0.474	0.579	0.526	0.833	0.529	0.500	0.333	0.350	0.333	1.000	0.333	0.263	0.222	0.235	0.500	0.158
T17	0.412	0.313	0.400	0.438	0.400	0.167	0.286	0.250	0.357	0.278	0.333	0.133	0.077	0.214	0.273	0.333	1.000	0.273	0.091	0.000	0.214	0.091
T18	0.412	0.313	0.313	0.438	0.273	0.167	0.286	0.429	0.267	0.353	0.333	0.417	0.273	0.133	0.400	0.263	0.273	1.000	0.200	0.000	0.417	0.091
T19	0.294	0.357	0.267	0.167	0.333	0.200	0.067	0.286	0.133	0.313	0.077	0.364	0.333	0.154	0.333	0.222	0.091	0.200	1.000	0.125	0.364	0.250
T20	0.167	0.286	0.059	0.111	0.000	0.100	0.154	0.063	0.143	0.176	0.083	0.000	0.222	0.273	0.000	0.235	0.000	0.000	0.125	1.000	0.077	0.286
T21	0.588	0.500	0.600	0.444	0.308	0.308	0.313	0.643	0.375	0.529	0.267	0.538	0.308	0.250	0.545	0.500	0.214	0.417	0.364	0.077	1.000	0.071
T22	0.158	0.188	0.188	0.235	0.091	0.091	0.067	0.125	0.133	0.167	0.077	0.071	0.200	0.364	0.000	0.158	0.091	0.091	0.250	0.286	0.071	1.000
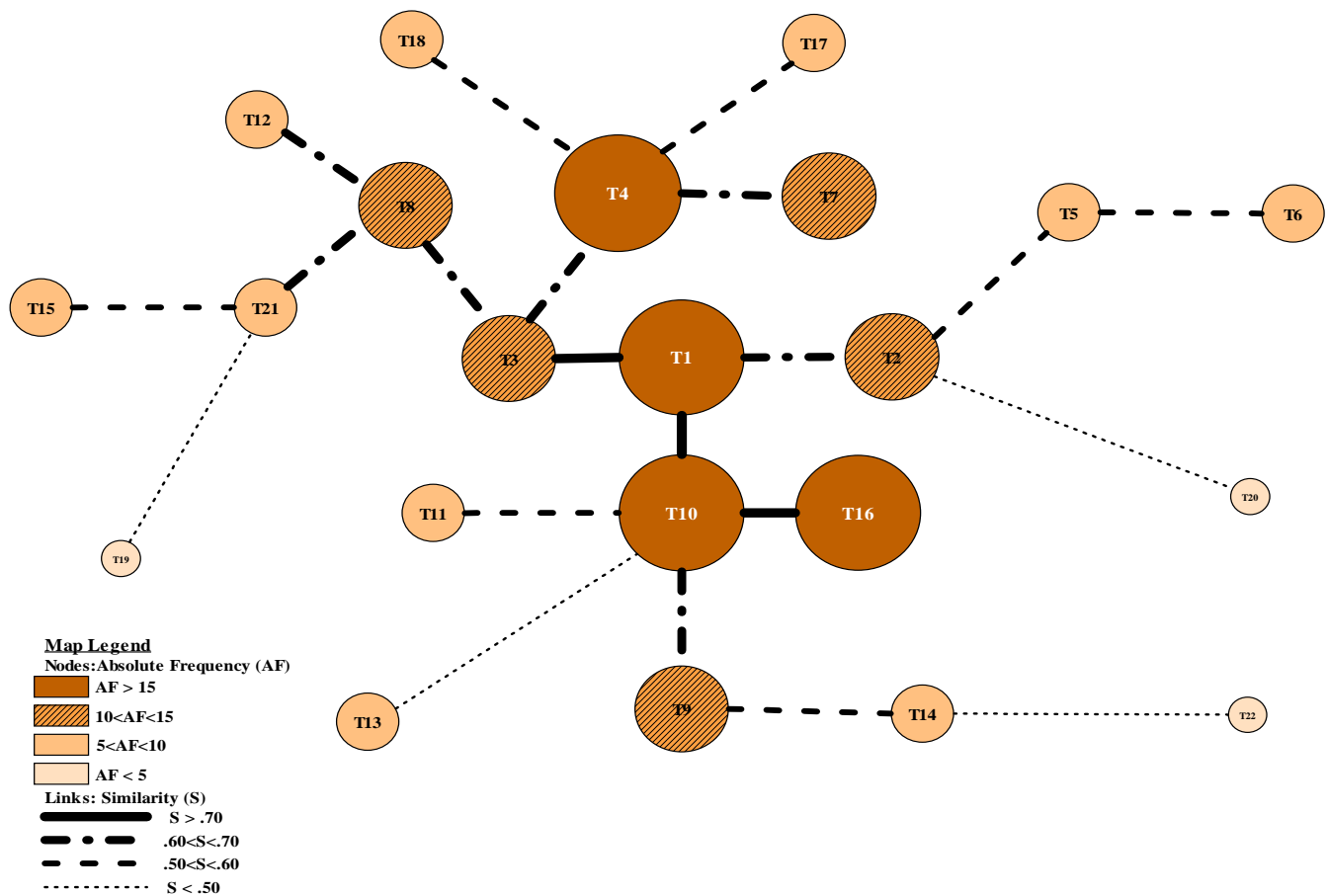
Figure 2. Social Representation Map of Job-Related Burnout

In the final stage of data analysis we made an attempt to explore the core-periphery structure of the social representation of burnout. Abric (2001) identified three fundamental criteria that characterize elements belonging to the central core, namely symbolic value, expressive value and associative value. According to Abric, *symbolic value* stems from the generating function of the core and is based on the concept that central elements cannot be questioned without affecting the signification of the entire representation. A number of experimental and empirical methods have been developed that utilize this principle to discover elements that form the central nucleus of the representation (Flament et al. 1998). *Expressive value* assumes that, due to their place in the representation, central elements will be more frequently present in the discourse concerning the object of the representation than their peripheral counterparts. The final criterion, *associative value*, is operationalized as a degree of connectivity of an element within a representation. Because central elements are responsible for giving meaning to the representation, they must be associated with a larger number of representation constituents than are any of the peripheral elements.

Among the three aforementioned criteria only the first one, symbolic value, is deemed sufficient to establish the core status of an element. The other two are necessary but not sufficient conditions. Since the objective of this study was to make a first approach to understanding the structure of the representation, we focused our attention primarily on evaluating the two latter criteria of centrality. Symbolic value of the items was not assessed in this study as it would have required conducting additional experiments and/or administering more surveys. While our approach does not allow for unambiguous definition of the core elements, it provides enough information to outline which components of the map presented in Figure 2 might form the central nucleus of the representation.

In this study, expressive value was measured by computing frequencies of appearance of individual elements in the source data. This parameter, termed salience, is widely used in social representation analysis (Abric 2001, Nicolini 1999). Associative value was assessed by means of two indexes, sum similarity and coreness. Sum similarity is conceptually analogous to the notion of

Table 4. Core-Periphery Structure

Element	Coreness	Salience	Sum Similarity	
Topic 1	0.344	17	11.27	core
Topic 10	0.323	16	10.812	
Topic 16	0.303	17	10.385	
Topic 8	0.296	13	10.33	
Topic 3	0.287	14	10.116	
Topic 4	0.283	16	10.115	
Topic 2	0.257	14	9.824	
Topic 21	0.243	10	9.159	
Topic 9	0.236	12	8.989	
Topic 12	0.221	10	8.552	
Topic 7	0.186	11	7.966	periphery
Topic 11	0.167	9	7.249	
Topic 5	0.151	7	7.359	
Topic 15	0.15	7	7.026	
Topic 18	0.148	7	7.051	
Topic 14	0.144	10	7.281	
Topic 6	0.143	7	7.042	
Topic 17	0.123	7	6.333	
Topic 13	0.108	7	6.461	
Topic 19	0.087	5	5.93	
Topic 22	0.011	5	4.102	
Topic 20	0	4	3.56	

closeness of a graph (Sabidussi 1966), and was calculated as a sum of the similarities of an element to all other elements in the IAS matrix. An item with high sum similarity is "close" to a large number of other components of the representation, and thus has to have high associative value. Finally, a continuous model of core/periphery structure was fit to the IAS data matrix to estimate coreness (i.e., closeness to the core) of each element. This method was developed by Borgatti and Everett (1999) to discover core/periphery structures in network data consisting of continuous values representing strengths of relationships. Table 4 summarizes our findings with regard to the structural analysis of the representation.

Discussion

The social representations map in Figure 2 provides an initial view of the concepts (and relationships among those concepts) through which IT professionals may organize their understandings of burnout in the profession. As a preface to interpretation of the map and implications for future research, it is important to stress that this study represents only a first step in understanding how these professionals make sense of burnout in IT. Our data analysis results, for example, are valid only under the assumption that categories that emerge from the content analysis are representative of attributes of a specific phenomenon that is reflected in the social representation under investigation (Hammond 1993). In addition, as Abric (2001, p. 44) cautions, "The centrality of an element cannot be conceptualized exclusively in quantitative terms. On the contrary, the central core has, above all, a qualitative dimension. It is not the presence of an important element which defines its centrality, but rather the signification it gives to the representation." Given that understanding, then, the following preliminary observations are offered:

- *Three concepts appear central to IT professionals' understanding of burnout: (T1) working long hours over an extended period of time/heavy workload, (T10) emotional strain/negative emotions, and (T16) negative impacts on job performance.*

  First, while IT work presents a number of potential sources of job-related strain (stressors), these professionals saw pressures leading to long work hours (in some cases without even occasional relief) as a primary stressor. Although other stressors also appeared on the map, e.g., interpersonal issues (conflict/friction with users and colleagues) (T8) and skills issues such as the need to constantly retool (T19), these appear to be secondary to issues of increased expectations of overtime and the 24-7 (365 days a year) nature of IT work. Second, emotional strain/exhaustion also appeared central to subjects' understandings of burnout. Among the emotional responses mentioned in the interviews were depression/feeling deflated, anxiety, frustration/anger, and panic in addition to a general state of emotional exhaustion. Lastly, perceptions of negative impacts of burnout on job performance incorporated both the *inability* to function normally, keep up with the job, seeming insurmountability of even small tasks, etc., and the *lack of motivation* to perform (e.g., lack of enthusiasm/enjoyment from work, low morale, not caring).

- *Project issues (T3) emerged as a key organizing concept, relating IT management/supervision issues (T4) and interpersonal issues (T8) with the primary stressor: working long hours/heavy workload (T1).*

  One possible interpretation of this grouping of concepts is that IT professionals see projects as the primary work environment where pressures for long work hours and heavy workload are likely to occur. In the interviews, subjects relayed a complex set of concerns and issues related to project selection, prioritization, planning, management, deadlines, unexpected requirements and demands, and other problems seen as outside of the control of project lead or team members. Perhaps most telling is the strong relationship in the social representation between these issues and perceived shortcomings of IT management and supervision, including skills, actions, and overall effectiveness. Examples of concerns voiced by the subjects were lack of awareness of the seriousness of the problems or severity of the strain by managers and supervisors, lack of consideration of the long-term ramifications of their decisions, the need for open communications and honesty, and the value of showing appreciation for employees' efforts and contributions (from pats on the back to a gift of a special bottle of wine for an employee who is a wine connoisseur).

- *Peripheral concepts are reflective of the current business environment—e.g., job market/lack of job security (T14), competitive business environment (T4), and corporate culture/values/ethics (T6).*

  In addition to pointing to concerns stemming from circumstances in the larger business environment, the peripherality of these elements in the social representation lends additional evidence that the concepts identified in this analysis as comprising the core (e.g., extended work hours, project issues) are central to IT professionals' understandings of burnout. As previously noted, social representation theory views concepts at the periphery as the area of adaptation based on new information or transformation of the environment, and this appears to be reflected in the current map.

Directions for Future Research

This study is the first step in framing a program of research on burnout in the IT profession. Our goal is to develop a program that draws upon general theory on job-related stress and burnout, but at the same time reflects issues and concerns specific to the IT profession. The social representations map developed in this study provides insights into some of those key issues, such as extended work hours, heavy workloads related to project issues, and concerns regarding IT management and supervision. As a next step in the research, we plan to compare the social representations map from this study to theoretical models of burnout in order to assess alignment and fit of the representation with those conceptualizations. Another follow-on project will be a review of the burnout literature, focusing in particular on insights and understandings related to the issues identified in this exploratory study. Finally, empirical studies to further explore social representations of burnout in IT are also planned.

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