

Effects of the self-schema on perception of space at work

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Abstract

The purpose of this research is to show that a person's self-schema can affect his or her perception of reality at work. Results show that significant differences in environmental perception and workspace evaluation exist between people with a self-schema of professional failure and those with a self-schema of professional success. The findings suggest that the self-schema filters information about the environment in two directions, affecting how people assess their work environment, and also how they see themselves on the basis of the attributes and functioning of their work environment. The study has interesting implications for a better understanding of the complexity of the person–environment relationship in the workplace.

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1. Introduction

The psychology of the work environment has been widely recognized in recent years as an important area of research. New social attitudes have encouraged research in various areas of person–environment interaction. In addition, major changes in the way work is performed in our society have resulted from new technology, increased female participation in the workforce, and the growing importance of work in western culture (Goumain, 1989; Csikszentmihalyi, 1996; Goldfinger, 2000). As a result, the concept of 'workspace' has evolved within environmental psychology as a topic for research aimed at a new way of understanding the work environment through the interaction between workspace design, tasks and activities at work, and employee behavior (Fischer, 1989).

To date, research in this area has yielded at least two areas of activity: first, analyzing behavior in various types of office space, including measuring the effects of environmental design on 'productivity'; and, second, measuring employees' perceptions of their workspace. It is this latter direction that informs the study reported here. This paper explores the relationship between the characteristics of an individual's identity (sense of self or 'self-schema') at work and how the physical work

environment is perceived. The social dimensions of sense of self are factors that regulate both user perceptions and users' evaluation of the work environment (Monteil, 1992, 1993). The goal of this research is to demonstrate that the 'self-schema' acts as a cognitive filter in two ways, affecting first how people perceive their work environment, and second how people's evaluation of their workspace affects their perceptions both of their work and of themselves. Accordingly, people with a self-schema of professional failure (resulting from internalizing real or perceived negative reinforcement on a regular basis at work) are likely to perceive the workspace differently from those with a self-schema of professional success.

2. Workspace evaluation

The concept of 'workspace' has its origins in environmental analysis, the theory of which incorporates both the functional and the psychological meaning of space; it has several meanings. First, workspace means physical places, designed and used for specific activities. In this sense, space has an architectural significance that includes but is not limited to physical, functional, and esthetic dimensions. Second, workspace can be construed as a matrix of several work-related activities; in this sense it is not only an external support to them, but is also integral to the important

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relationship between space and work. Third, workspace can be seen as a context for people's social and professional relationships, and, in this sense, is experienced at both an individual and a collective level in terms of how employees feel about their work, and about the organization where they work.

The user can therefore be seen as 'managing' his relationship with workspace, a relationship characterized as much by *cognitive* mechanisms of spatial orientation, place identification, doing work, and feeling secure, as by an *affective* reaction that may be positive or negative, translating into satisfaction or dissatisfaction. The experience of workspace, therefore, causes people to attribute meaning and feelings towards what they do at work, as well as about who they are (Stokols, 1978).

The process of evaluating or assessing workspace is a cognitive and affective response by users to their knowledge of it, as well as an expression of their satisfaction with it (Preiser & White, 1988). Each environmental feature is a stimulus that can provoke a behavioral response: users' perceptions of the environment require them to invoke a cognitive schema that uses additional information typically yielded through environmental exploration and manipulation (Downs & Stea, 1975). As this cognitive processing evolves, new knowledge is generated, which, in turn, allows the user to make choices about how to act.

As previous studies have shown, user assessment of workspace occurs on many levels: cognitive, aesthetic, affective, functional, normative, active and temporal (Lévy-Leboyer, 1982). Studies indicate that the ways workspace is assessed by users is a function of their cognitive schemata, in that perceived environmental features are compared with pre-existing standards of quality (Stokols, 1978; Vischer, 1989). These standards are mostly determined by personal expectations and prior experience. Degree of familiarity with the environment and the symbolic value attributed to its characteristics, as well as users' social and occupational status and previous workspace experiences, are all factors which define the standards against which workspace is evaluated by users (Becker, 1981).

Three major categories of mediating influences on workspace satisfaction are individual differences, organizational context and environmental features. *Individual differences* include individual role and responsibilities in the organization, the kind of work being done, specifically task complexity, expectations regarding the type of space occupied, and level of satisfaction with organizational status (Gerngross-Hass, 1982). 'Locus of control' and personal display, as well as feelings about work, also affect assessment of workspace (Sundstrom & Sundstrom, 1986). *Organizational context* includes corporate goals and objectives, organizational activities, organizational culture, and employee rela-

tions, all of which have an impact on the degree of satisfaction people feel with their environment (Marans & Spreckelmeyer, 1982; Steele, 1986). Finally, objectively defined *environmental features* (e.g. office size, partition height, window access, furniture) affect workspace perception and users' judgments specifically through the functions they perform their symbolism, their intrinsic meaning, and the meaning attributed to them by the user.

Environmental features that have attracted most attention in recent years are associated with the open-plan office. Hedge (1982) identified seven features of open-plan offices that affect users. He found that seventy-five per cent of people working in open-plan workspace explain their satisfaction levels in terms of these workspace features, which, taken together, account for a significant percentage of the observed variance. More recent studies (Penn, Desyllas & Vaughn, 1999; Horgen, Joroff & Schon, 1999) have found that although office workers value contact and communication, they still resist open plan workspaces. This reaction is more pronounced if they are moving out of enclosed offices (Churchman, Stokols, Scharf, Nishimoto & Wright, 1990). And in a recent study of behavior related to office furniture configurations, Brill (2001) rated concern about distractions and interruptions as more important to workers than any other factor.

Wells (2000) argues for a direct link between workspace satisfaction and job satisfaction, demonstrating that the ability to personalize workspace is an important contributor to the former. Gender differences in workspace personalization were also found in a study showing different amounts and types of personalization related to job rank, as well as number of years of employment. These and other studies suggest that a range of individual differences (personality traits, gender, individual experience) affect perception of, and hence evaluation of the work environment (Vischer, McCuaig, Nadeau, Melillo & Castonguay-Vien, 2002). How employees assess their work environment is therefore only partially related to environmental features; their level of satisfaction is also affected by their feelings about what they do as well as by their own sense of identity, of which the dimension of sense of self, or self-schema, is an important activator.

3. The self-schema dimension

According to Brewer (1986), all of one's knowledge and awareness of self can be organized into a self-schema. As defined by Markus (1977), the self-schema is a cognitive structure containing the generic knowledge that one has about oneself and uses to organize, summarize and explain one's behavior. Markus explains

that self-schemas imply the generalization of knowledge acquired from past experience; they organize and guide the processing of information about the self in social situations. The self-schema can therefore be viewed as a construct with which to interpret one's own and others' behaviors; it allows one to form a clear idea of the type of person one is in a particular situation. The self-schema is a basis for perceiving and interpreting one's own behavior and thereby understanding one's social interactions (Markus & Smith, 1981).

The structure of the self-schema is derived from observation, followed by interpretation, explanation and summarizing the consistent elements of one's behavior and experience in a range of situations (Martinot, 1995). The idea is not completely new, as Sarbin (1952) already proposed the self as a cognitive structure capable of organizing, modifying and integrating behavior. Some theorists (for example, Neisser, 1976) have gone further and asserted that people only acquire information for which they already possess a schema and ignore everything else. In these terms, people whose schemata include professional success, that is, who believe they have succeeded or will succeed at work and who attach importance to their professional success, will integrate in the self-schema all information about the self that has a bearing on professional success, and will explain their own behavior in these terms. Monteil (1993) allocates the properties of a schema, at least in part, to cognitive structures of self-awareness. It is therefore possible to apply to the concept of self the same rules and theories of classification as would apply to any other memory concept.

Markus demonstrated the existence of a self-schema in terms of a dependence-versus-independence dimension, and then evaluated its impact on the selection and processing of information about the self. Some authors have gone beyond the generic nature of the dependence-independence self-schema to postulate the existence of more specific self-schemas, such as an academic self-schema (Tarquinio & Somat, 2001), and a professional self-schema (Somat & Tarquinio, 1998; Somat, Tarquinio & Dufresne, 1999).

Self-schemas take time to develop and mature as a result of repeat experiences in comparable situations (Greenwald & Banaji, 1989). Hence people in work situations are likely to have a professional sense of self

that is continually defined and redefined as a function of their daily work experiences. Using this reasoning, Somat et al. (1999) hypothesized a professional self-schema within the framework of Markus's paradigm. After assigning employed and unemployed workers to groups matched on scales of professional success and failure, they asked subjects to complete a set of two cognitive tasks designed to evaluate the influence of professional self-schemas on selecting and processing information about the self. The results showed, first, that subjects with self-schemas of professional success were more likely to judge items linked with success as being descriptive of themselves than were subjects with self-schemas of failure. Second, the study found that subjects with self-schemas of professional success made their assessments more quickly than those with self-schemas of failure; and third, that subjects with self-schemas of professional success were more likely to recall self-descriptive behaviors linked with success than with failure.

It would therefore seem that, throughout their lives, individuals acquire knowledge about themselves from their social and professional situations. The professional self-schema is formed as a result of repeated positive or negative feedback people receive in their work situations that reinforces either a positive (successful) or a negative (unsuccessful) sense of self over time. It seems reasonable to suppose that workspace has a role in this process, either through judgments employees make of the environmental characteristics of the spaces they occupy, or through information communicated to employees about themselves by the spaces they have been allocated. A theoretical model linking work satisfaction, employees' sense of self, and workspace perception and evaluation is proposed, as shown in Fig. 1.

4. Research outline and hypotheses

The purpose of this study is to show that the self-schema functions as a cognitive filter in terms of people's perception of their work situation, and that it affects the ways users judge both their work environment (workspace) and the work that they do. Three hypotheses are tested. The first hypothesis states that workers with a

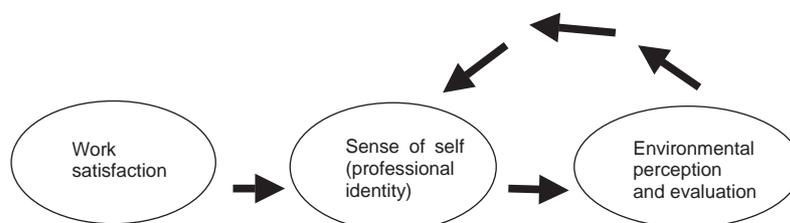


Fig. 1. Model linking employee satisfaction with the work environment.

self-schema of professional failure (which is the result of internalizing recurring negative or perceived negative feedback from their work situation) have a different perception of their workspace from workers with a self-schema of professional success.

To facilitate analysis of the self-schema's cognitive filtering function, Lewin's (1951) definition of the psychological value of topological space is invoked to explain how workers accept, use, invest in or reject their space at work. According to this view, workspace is more than simply the sum of the functional attributes of the office a person occupies; at least two levels of psychological meaning can be attributed to workspace. The first of these is 'place identity', in which an occupied space is identified as a 'place' as a result of the process whereby the physical environment is incorporated into employees' sense of self. The second meaning devolves from the company's rules and procedures for allocating office-space. How these criteria are applied can cause people to see their workspace as symbolizing job-related success or failure, and as according them status (or lack of it) at work.

The ways companies allocate workspace are indicative of corporate cultural values and social norms. A person can perform important and interesting work, yet feel that he or she is not 'in the right place'. The 'right place' is one that enables each worker to make appropriate connections with others, and to define a zone of influence inside the organization. The level of satisfaction or dissatisfaction a person has about the space or place allocated to them at work can reinforce their professional self-schema in either a positive or a negative direction, and can thereby affect their perceptions of and feelings about their work as well as about their work environment. The hypothesis that users' perceptions of their work environment vary according to whether workers have a self-schema of professional success or one of professional failure can be tested by measuring differences between these two groups of workers. Significant differences are expected on measures of workplace satisfaction, sense of privacy, job satisfaction, and perception of the work environment as measured according to a semantic differential test.

In addition, and independently of self-schema classification, a second hypothesis posits a convergence (positive and significant correlations) between various different measures of workspace evaluation by occupants (described above). Thirdly, based on the idea that workspace is not simply a physical context but also a personal territory that occupants identify with, a link is hypothesized (positive and significant correlation) between how employees evaluate their work (using different adjectival descriptors) and their workspace satisfaction, their sense of privacy, their job satisfaction and their perception of the work environment.

5. Method

In order to test the hypotheses, we asked subjects to complete two questionnaires, of which one measures professional failure and success and was designed on the basis of Markus's paradigm and the work of Martinot (1993) and Tarquinio and Somat (2001). Subjects were assigned to two matched groups on the basis of the results (see Section 5.1, below). The second questionnaire required subjects to evaluate their workspace (satisfaction with workspace, level of spatial comfort, sense of privacy), their job satisfaction, their work performance, and their perceptions of the workspace (using a semantic differential test).

5.1. Sample selection

One hundred twenty subjects were invited to participate in the study, of which 50 were finally selected. As one objective of the study was to refine the definition of professional self-schema, the size of the sample was limited to those who could be classified accordingly. Furthermore, it was easier to identify people with self-schemas of professional success ($n = 29$) than to find candidates with self-schemas of professional failure ($n = 21$). This constraint added to our concern to ensure equal status for all subjects and limited our selection of people with self-schemas of professional failure.

Each subject was asked to answer nine questions in three categories pertaining to professional success, by rating him or herself on a 21-point scale.¹ The allocation of subjects to one of two groups (professional success and professional failure) was based on Markus' characterization of subjects as 'dependent' or 'independent' according to where they placed on his 11-point scale measuring the independence-dependence dimension of the self-schema. Markus considered 'aschematic' those situated in the middle of the scale and who rated it as unimportant. Of the 120 people invited to participate

¹Based on Martinot (1993) and Somat et al. (1999), nine items were selected to yield scores on three behavioral dimensions: (1) professional success ("Do you think that you succeed professionally? Do you think you are good at your profession? Do you feel you get good professional results?"); (2) the relative importance of professional success ("Do you think that professional success is important? Do you think it is important to be good at your profession? Do you think that professional success is necessary for success in life?"); and (3) the importance the respondents attached to their own success ("Do you think your professional success is important? Do you think it is important that you are successful professionally? Is it important to you to be good at your profession? Is your professional success important for you to feel you have succeeded in life?"). Each item was structured as a 21-point Likert scale, ranging from "In complete agreement" to "In complete disagreement". In order to avoid order bias, three different ways of presenting the nine self-schema items were used. The nine items show a high level of internal consistency (Cronbach's $\alpha = 0.81$).

Table 1
Physical characteristics of respondents' office-space

Average size (sq. metres)	18 m ²
Range of sizes	18.2–17.8 m ²
Space per person in shared offices	2.05–1.76 m ² per person
Average partition height	2.10 m
Air-conditioned	32 (64%)
Office with window	26 (52%)
Plants	32 (64%)
Personal computer	50 (100%)
Furnishings	Desk (100%)
	Chair (100%)
	File cabinet 39 (78%)
	Meeting-table 41 (82%)

in this study, those allocated to the professional success group were situated at the 'success' end of the scale (between 1 and 7 on the 21-point scale) for at least 2 of the 3 questions in each of the three categories, and also classified themselves as "good at my profession" according to a choice of "good", "average" or "bad at my profession" response categories. Those allocated to the professional failure group were clustered at the failure end of the scale (between 14 and 21) for at least 2 of the 3 questions in each of the three categories, and also classified themselves as "average" or "bad at my profession" according to the three response categories. The remaining subjects were classified as aschematic.

All subjects are white-collar professionals (51% male and 49% female) who were recruited from some ten companies in the Lorraine region of France. All work in standard open-plan or shared offices. The average age of respondents is 31.3 years (SD = 2.2). Eighty per cent of participants have a level of education equal to or superior to the baccalaureate and 20% are at a lower educational level.² All are mid-level managers in their companies.

All subjects worked in low-rise office buildings in the downtown areas of small towns in France. In all buildings, renovations had taken place within the previous 2 years. Offices were furnished with free-standing furniture rather than with integrated or systems furniture. The table below summarizes the physical characteristics of the respondents' workspaces.

There was no significant difference in office size (Student's $t = 0.72$, $df = 46$, $p = 0.47$) or in average number of people sharing an enclosed office (Student's $t = 0.36$, $df = 48$, $p = 0.71$) between the two groups of respondents.

²The baccalaureate is the school-leaving examination in the French system. Success is based on a series of national examinations taken at the end of the Lycée or high school. The results determine where the student may go for higher education.

5.2. Procedure

Subjects in both groups were asked to complete a questionnaire made up of scales drawn from and validated by previous research. The questionnaire was administered in 'double blind' format, in that the interviewer was unaware which of the respondents were classified into each of the two professional self-schema categories. The topic areas addressed by the questionnaire are Spatial comfort, Privacy, Job satisfaction, Perceptions of the workspace, and Evaluation of type of work. The choice of Spatial comfort and Privacy as key variables affecting workplace satisfaction is based on Fischer and Vischer's (1997) diagnostic method of evaluating workspace. This approach makes use of a standardized questionnaire survey form to collect a wide variety of data on users' environmental perceptions. It focuses on seven key dimensions of users' experience of their work environment (Vischer, 1989, 1995; Fischer & Vischer, 1997). These are Air Quality, Occupant Noise Control, Thermal Comfort, Spatial Comfort, Privacy, Lighting Quality, and Building Noise Control. Two of these factors are directly related to schema of self: Spatial Comfort and Privacy.

5.2.1. Spatial comfort

The diagnostic method of assessing workspace asks building occupants to assess their Spatial comfort, that is, their level of satisfaction with such elements of their workspace as amount of work surface, workspace layout, furniture comfort, and amount of storage space. This dimension of the diagnostic method is closely related to psychosocial concepts such as territoriality and personal space. A low satisfaction rating (low score) on Spatial Comfort can mean a lack of space or privacy, or simply a lack of psychological comfort. The three spatial comfort / workspace satisfaction items are: The size of your office corresponds to your position in the organizational hierarchy; You have enough storage space; Conditions at work are appropriate to your activities. Each item was presented as a 4-point attitude scale ranging from (1) Strongly disagree to (4) Strongly agree.

5.2.2. Privacy

There is an important link between Spatial Comfort and Privacy. In western culture, feelings of privacy are linked with physical elements of enclosure (walls, partitions, etc.). However, several studies have shown that privacy is more complex than physical enclosure; occupants' experience of privacy goes beyond simple physical features and can also refer to the organizational context and norms (Brill, Margulis, & Konar, 1985; Hedge, 1987). Cultural factors as well as age and status differences affect both the experience and the definition of privacy; Altman

(1975) defines privacy as degree of individual control over space and over one's accessibility to others. Vischer (1989) asserts that the perception users have of their privacy is based on visual privacy as well as on acoustic and conversational privacy. The seven items that measure subjects' privacy are: There is enough space between you and your colleagues; Your organization provides you with your own individual workspace; You have adequate privacy in your workspace; It is difficult for you to get work done owing to the noise around you; You can decide when you want to speak to other people; You are often interrupted while working and you cannot do anything about it; You feel at home in your own workspace. Each item was presented as a 4-point attitude scale ranging from (1) Strongly disagree to (4) Strongly agree.

5.2.3. Job satisfaction

The data collection phase of the study concluded with an evaluation of employees' job satisfaction. The items were developed from a content analysis of the results of a series of interviews administered to respondents prior to the study. The seven job satisfaction items are: The work you are currently doing is what you expected; The work you are doing corresponds to your job description; Your activities and your role in the company are sufficiently clear; The work you are doing gives you the chance to participate in activities that you prepared for; You have sufficient autonomy to develop your work; You define yourself as highly motivated; People around you consider that your work is interesting. Each item was presented as a 4-point attitude scale ranging from (1) Strongly disagree to (4) Strongly agree.

5.2.4. Perceptions of workspace

To complete the testing, a semantic differential test of workspace perceptions was then given to all subjects. Fischer (1980) has described the semantic differential as a method of evaluating a concept using adjectival scales that are bipolar and independent; subjects tend to make differentiated judgments on an affective basis. The semantic differential used here comprises 24 adjectival scales with values ranging from 1 to 4. The numeric value of point on the scale denotes the psychological weight of the adjective, therefore a value of 3 has greater weight than a 1 or a 2.

Each subject was asked to evaluate his or her workspace on the 24 scales. Subjects' responses on each scale are not generally independent of one another; some of the scales are positively correlated. When factor analysis was used to examine these correlations, three latent dimensions or factors were identified (Osgood & Suci, 1955; Osgood, Suci, Tannenbaum, 1957). Osgood (1962) explains these as: (1) *Evaluation*, which links the scales Unpleasant/pleasant and Sad/gay, recalling the Lewin's notion of space as a topological field described

in esthetic, symbolic and affective terms; (2) *Power*, which links the scales Strong/weak and Light/dark and denotes the effort necessary to adapt to the work environment and space; and (3) *Activity*, which links the scales Noisy/calm, and Near/far and speaks to the worker's relationship to the task and to his job. This last dimension implies user satisfaction and sense of accomplishment, and can be construed as territorial occupation. The higher the score on the 4-point scale, the more positively subjects evaluate their workspace on these three dimensions.

5.2.5. Evaluation of type of work

Finally subjects were asked to describe the nature of their work. Five adjectives were presented to them: *Complex, Creative, Abstract, Pleasant, Interesting*. Each adjective was accompanied by a 4-point attitude scale, ranging from (1) Strongly disagree to (4) Strongly agree.

6. Results

Subjects' responses to questions about both their work environment and their work allowed several indices to be calculated. First, a Spatial comfort index was created³ (Cronbach's $\alpha = 0.69$), then a Privacy index⁴ (Cronbach's $\alpha = 0.61$), and finally a Job Satisfaction index were created⁵ (Cronbach's $\alpha = 0.85$).⁶ A factor analysis was carried out on the 24 semantic scales in order to define indices of workspace perception; the results of a Principal Components factor analysis with varimax rotation were selected as having most internal consistency. The two dimensions or factors identified after rotation were Evaluation (good/bad) and Activity (active/passive), explaining respectively 28% and 18% of the total variance. The third possible factor identified was not sufficiently homogeneous nor internally consistent (Cronbach's $\alpha = 0.15$) and was not analyzed. The first two dimensions were analyzed and an index of

³The size of your office corresponds to your position in the organizational hierarchy; You have enough storage space; Conditions at work are appropriate to your activities.

⁴There is enough space between you and your colleagues; Your organization provides you with your own individual workspace; You have adequate privacy in your workspace; It is difficult for you to get work done owing to the noise around you; You can decide when you want to speak to other people; You are often interrupted while working and you cannot do anything about it; You feel at home in your own workspace.

⁵The work you are currently doing is what you expected; The work you are doing corresponds to your job description; Your activities and your role in the company are sufficiently clear; The work you are doing gives you the chance to participate in activities that you prepared for; You have sufficient autonomy to develop your work; You define yourself as highly motivated; People around you consider that your work is interesting.

⁶The alphas lower than 0.8 have been retained as they are meaningful in terms of the number of items used to calculate them.

Table 2
Mean difference on each index^a

Index	<i>M</i> , σ , <i>N</i>	Statistics
Spatial comfort	Failure: <i>M</i> = 8.9, σ = 1.6, <i>n</i> = 20 Success: <i>M</i> = 10.1, σ = 1.19, <i>n</i> = 29	<i>t</i> = 2.98, <i>df</i> = 47, <i>p</i> = 0.004
Privacy	Failure: <i>M</i> = 19.6, σ = 3.4, <i>n</i> = 20 Success: <i>M</i> = 23.4, σ = 2.6, <i>n</i> = 28	<i>t</i> = 4.37, <i>df</i> = 46, <i>p</i> = 0.000
Job satisfaction	Failure: <i>M</i> = 18.9, σ = 3.7, <i>n</i> = 21 Success: <i>M</i> = 21.7, σ = 4, <i>n</i> = 29	<i>t</i> = 2.44, <i>df</i> = 48, <i>p</i> = 0.018
Evaluation factor	Failure: <i>M</i> = 16, σ = 3.3, <i>n</i> = 19 Success: <i>M</i> = 20.9, σ = 4.3, <i>n</i> = 29	<i>t</i> = 4.15, <i>df</i> = 46, <i>p</i> = 0.000
Activity factor	Failure: <i>M</i> = 14.7, σ = 3.61, <i>n</i> = 19 Success: <i>M</i> = 18.3, σ = 3.67, <i>n</i> = 27	<i>t</i> = 2.97, <i>df</i> = 44, <i>p</i> = 0.005

^aLevenes' tests for homogeneity of variance were all non-significant.

workspace perception as Good/bad (Evaluation factor)⁷ was constructed (Cronbach's α = 0.84), as well as an index of workspace perception as Active/passive (Activity factor)⁸ (Cronbach's α = 0.79).

All the indices were calculated for the self-schema of professional failure subjects and for those with a self-schema of professional success. It was therefore possible to use Students' *t* to test whether or not there were significant differences on each index for each group. The results are presented in Table 2.

The table shows that the results converge to show a significant difference between the failure group and the success group on each index. The latter are more satisfied with their work environment than the former. Those with a professional self-schema of success are more likely to estimate that the size of their workspace corresponds to their expectations relative to their position in the organizational hierarchy. Similarly, they feel they have enough space and they have appropriate work conditions, whereas those with a self-schema of failure rate these factors more negatively. Moreover, those in the failure category report less job satisfaction than those in the success category. Similarly, those in the success category feel they have more privacy than those in the failure category, who seem to feel they have less privacy and are less protected in terms of space between co-workers, space personalization and control over space.

The results show that the group with a self-schema of failure is overall less satisfied than the group with a self-schema of success. This seems to apply as much to the nature of their work as to their feelings of autonomy, their motivation, and level of interest in what they are doing. For respondents with a self-schema of failure, no

aspects of the work environment seem to correspond to their expectations.

Finally, the findings on perception of workspace indicate that respondents in the self-schema of professional success group have a more positive and a more active perception of their workspace than those in the self-schema of professional failure group. The former tend to perceive their space in positive esthetic and affective terms that are associated with both personal satisfaction and a sense of accomplishment.

The correlation coefficients between the different indices were calculated, and these are presented in Table 3.

Analysis of these results shows that not all the correlations between the different indices are significant; in fact, only the correlations between Privacy and Spatial comfort ($r = 0.54$, $p < 0.01$) and between Privacy and Workspace evaluation ($r = 0.36$, $p < 0.05$) are significant. It should also be noted that the correlation between the Evaluation (good/bad) factor and the Activity (active/passive) factor is significant ($r = 0.51$, $p < 0.01$), as would be expected.

Finally, Table 4 below shows the significant correlation coefficients between the five indices of workspace perception and overall satisfaction with work, as measured by five descriptors on a 1–4 point attitude scale.

The table shows that Spatial comfort correlates with work as "Pleasant", and that Privacy correlates significantly with work as both "Pleasant" and "Interesting". It would seem that the more subjects feel they can control their exchanges with others (that is, their privacy) in various ways, the more likely they are to judge their work as pleasant and interesting. Job satisfaction correlates significantly with "Creative" work; and respondents who rate their work "Complex", "Creative", "Pleasant" or "Interesting" attribute positive esthetic and emotional qualities to their workspace (Evaluation Factor). There are no significant correlations with the Activity dimension.

⁷Unpleasant/pleasant, stormy/calm, dispersed/concentrated, uninteresting/interesting, ugly/beautiful, stressful/restful, sad/gay, violent/peaceful.

⁸Noisy/quiet, near/far, lethargic/energetic, slack/vigorous, static/dynamic, unmoving/animated, inanimate/animate.

Table 3
Correlation coefficients between indices

	Spatial comfort	Privacy	Job satisfaction	Evaluation factor	Activity factor
Spatial comfort	1				
Privacy	0.54** (<i>n</i> = 48)	1			
Job satisfaction	0.14 (<i>n</i> = 49)	0.26 (<i>n</i> = 48)	1		
Evaluation factor	0.08 (<i>n</i> = 48)	0.36* (<i>n</i> = 47)	0.24 (<i>n</i> = 48)	1	
Activity Factor	0.02 (<i>n</i> = 46)	0.16 (45)	0.18 (<i>n</i> = 46)	0.51** (<i>n</i> = 45)	1

***p* < 0.01; **p* < 0.05.

Table 4
Correlations between workspace perception indicators and overall satisfaction with work

	Complex	Creative	Abstract	Pleasant	Interesting
Spatial comfort	—	—	—	0.30* (<i>n</i> = 49)	—
Privacy	—	—	—	0.39** (<i>n</i> = 48)	0.41** (<i>n</i> = 48)
Job satisfaction	—	0.56** (<i>n</i> = 50)	—	—	—
Evaluation factor	0.52** (<i>n</i> = 48)	0.36* (<i>n</i> = 48)	—	0.51** (<i>n</i> = 48)	0.59** (<i>n</i> = 48)
Activity factor	—	—	—	—	—

***p* < 0.01; **p* < 0.05.

7. Discussion

The purpose of this research was to show that the ways in which office workers perceive and judge their work environment is a complex cognitive process in which personal characteristics play a specific role. Among the latter, the self-schema has been identified as having a specific regulatory function in regards to how the work environment is perceived by users. A more comprehensive understanding of this process was sought, as well as more detailed knowledge of how the self-schema influences workers' levels of satisfaction with their work.

The hypothesis was advanced that subjects having a failure-oriented professional self-schema would be likely to perceive and to judge their work environment differently from those with a success-oriented professional self-schema. The results showed that this was indeed the case: significant differences between the two groups were found on three indices of perception of the work environment, namely Privacy, Spatial comfort, and Job satisfaction. Fischer (1989) has shown elsewhere that those aspects of the office environment having a significant connection to users' personal space at work are in fact these three same factors, suggesting that people's personal space expresses how they feel about themselves. The results of this study elaborate on the nature of the relationship between personal space at

work and people's sense of self, by demonstrating that workers with a professional self-schema of failure evaluate various aspects of their environment more negatively than other workers; their office is a place they do not enjoy occupying and they judge its esthetic qualities more negatively. In contrast, workers with a professional self-schema of success show a greater appreciation of the same environmental qualities. It seems clear that both categories of worker perceive and evaluate their work environment as a function of the characteristics of their professional self-schemata. Moreover, the process of evaluating workspace can also be seen as characterizing the relationship people have to their work: subjects with a self-schema of professional success express greater job satisfaction than those with a self-schema of professional failure. In this respect, the findings support those of Wells (2000) linking workspace personalization to satisfaction with the work environment, and thus to job satisfaction.

More generally, results show that the meaning attributed by users to features of their workspace differs between the two groups. In spite of the fact that the environmental features of their workspace are comparable, they do not judge it as equally functional. Subjects with the self-schema of professional success value their workspace and integrate it into their positive vision of work so that it contributes to their high level of job satisfaction; they see it as useful, safe and healthy. Those

with the self-schema of professional failure attach less importance to these factors, suggesting that they have a more negative perception of the spaces they work in as well as of the work itself. These results suggest that the way people see themselves—that is, their professional self-schema—is itself affected by the way they judge or evaluate their workspace. Thus the two-way relationship between workspace and worker outlined by the theoretical model that guided the research—that employees' sense of self affects their perception of their space but at the same time, the way they judge their space also affects their sense of self—finds some support in the results of this study. The causal ambiguities of these results, however, do not allow firm conclusions to be drawn regarding the cause-effect relationship between perceptions of workspace and professional self-schema; they demonstrate only that there is an association. Other personality factors, or facets of people's outlook on life, could also affect, and be affected by, people's perceptions of their workspace.

It should also be noted that the sample size is small and limited to people of about the same age working in offices in small regional towns. A larger sample size, drawn from a wider range of age-groups in larger urban centers (that is, at different stages in their careers) may allow other conclusions to be drawn. The measuring tools and techniques used in the study appear sufficiently robust to warrant a similar data-gathering exercise on a more ambitious scale. A larger sample, drawn from a wider variety of office building types as well as from various levels of job responsibility, is recommended in order to confirm the positive results of this study and to ensure that the small sample size did not undermine the validity of the statistical tests that were used. In addition, qualitative data from interviews and focus groups could be presented to help round out the discussion of results and shed further light on the filtering function of the self-schema on perception and evaluation of workspace.

8. Conclusions

The results of this study pose some interesting questions for future research. Most studies of the psychology of the work environment question workers about their perceptions of their workspace, and from these judgments, draw conclusions about workspace satisfaction, job satisfaction and the relative merits of different environmental features. However, the significant results yielded by this study suggest also that these relationships are more complex. This research offers empirical support for the theoretical ideas expressed but not tested by many researchers (see review of Workspace Evaluation, above) that cognitive and affective factors—as exemplified by people's sense of self and

professional success—affect, and are affected by, how they perceive and judge their space at work.

The results of this research indicate a need to redefine both the role and the importance of causal factors in workers' perceptions of their work environment. Whereas most studies consider that various environmental elements (noise, color, light et cetera) affect the relationship between users and their workspace by 'causing' a behavioral or attitudinal response, the present research emphasizes the importance of psychosocial processes and their development in the context of a person–environment relationship conceived of as an interdependent system (Lewin, 1951). As a result, physical factors in the environment are not causal (deterministic) but, rather, relative (mitigated by psychosocial processes) in their effects on behavior. More detailed studies of the dynamics of the person–environment relationship would help uncover the distortions that can exist between objective physical characteristics and users' cognitive and affective evaluation of them, for example personality differences such as optimistic–pessimistic and introvert–extravert, as suggested by McCusker (2002).

By seeking to measure the power of the self-schema in people's perceptions and assessment of their work environment, this study has succeeded in demonstrating the importance of cognitive processes in sensitizing users to the physical features of a place. It has explained, in part, how workers attribute form and character to the place where they work, and has shown that the meaning employees confer on their workspace is directly linked to their sense of self, and specifically to whether they succeed or fail in the work that they do.

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