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## THE SOCIAL REGULATION OF COGNITION :

*From Color-Identification in the Stroop Task  
to Classroom Performances*

### INTRODUCTION

The situations in which human beings perceive, manipulate, and interpret information have traditionally been neglected by cognitive psychologists and cognitive scientists in general. According to Levine, Resnick, and Higgins (1993), the recognition of the importance of domain-specific knowledge led cognitive psychologists to take a first step towards the inclusion of social factors as part of cognition. This first step, however, did not specifically involve social factors but did highlight how particular, how situated or contextualized, cognition always is (Levine et al., 1993, p. 586). For example, the use of abstract problem materials to study reasoning processes in the 50's and 60's has fallen out of favour and psychologists have become much more interested in pragmatic influences or the use of real world knowledge (see Evans, 1993). Although this orientation is interesting, it is insufficient to capture the social dimension of cognition in its full complexity. As noted by Levine et al. (1993), not only is it necessary to attend to knowledge elements but also to the conditions of their use, that is, the situations and social relations in which cognition takes place.

Unfortunately, social psychology has neglected the study of social relations in the past two or three decades. Increasingly focused on the mental life of individuals, this scientific field has been dominated by a social-cognitive paradigm, "social cognition", intended to understand how individuals process information about their social world (Devine, Hamilton, & Ostrom, 1994; Fiske & Taylor, 1991). A basic assumption in this framework is that individuals in their social context --the classic focus of social psychology-- are virtually always engaged in some form of information processing. As in cognitive psychology, however, the situations in which this processing takes place have been and still are neglected in theory and research on social cognition (see Forgas, Williams, & Wheeler, 2000; Nye & Brower, 1996). In this perspective, it is mainly the fact that cognition applies to social objects that makes cognition "social". In contrast with this, we believe that the social dimension of cognition also refers to the fact that potentially all cognitive processes depend on the social context where they occur, regardless of whether these processes involve social or non-social objects. Human beings are consistently faced with the presence of others, engage in social

interactions and comparisons, belong to social groups, and are the object of a myriad of categorizations. In our opinion, it is this continuous social reality which truly defines the social nature of cognition (see Monteil & Huguet, 1999).

Our purpose here is to show that cognition is in fact better understood when taking into account its true social nature. That the social context in which cognitive functioning takes place is an integral part of that functioning is also the central message of most chapters from the present book. In the present chapter, however, this message does not derive from theory and research on interactive or collaborative learning (unlike most other chapters in this book). Instead, it is based on the intensive use of social-psychological paradigms investigating the influence of basic social factors which are typically neglected in the important literature on collaborative learning, namely, the presence of others and the social comparison episodes frequently associated with this presence.

Three categories of research are reported below. The first category reveals that the mere presence of others and relatively simple social comparison situations both can have a huge influence on responses that have been well established in psychology, suggesting that more can be learned about cognition in general when studying it in its social context. Based on specific findings taken from this first line of research, the second category shows how social comparison processes, especially one's comparison-level choice (i.e., the level of performance typical of the person(s) with whom one chooses to compare) can influence classroom performances. Finally, the third category provides evidence that students' past social comparison episodes play a critical role in the way they perform in actual social comparison situations, suggesting that autobiographical memory is a fundamental component of social regulation phenomena.

### SOCIAL PRESENCE AND COGNITION

The real, implied, or imagined presence of other people is one of the most prominent features of the social context of cognition, and interest in the way this presence affects cognitive performances has a very long history in social psychology (Guerin, 1993). Of particular interest here, recent studies in this area (see Huguet, Galvaing, Monteil, & Dumas, 1999; Huguet, Galvaing, Dumas, & Monteil, 2000; Huguet, Dumas, & Monteil, in press) suggest that the way individuals respond to the presence of others can be a source of significant advances in understanding primitive operations of cognition which are traditionally examined outside social psychology. More specifically, we argued and found that what has been thought to be invariant automatic processing in the cognitive literature on the Stroop effect is in fact controllable under specific social presence conditions.

In the Stroop task, individuals are required to identify the ink color in which words and control signs are printed. Typically, the time needed to identify the ink colors of incongruent words (the word 'RED' printed in green, for example) is greater than the time needed to name the ink colors of control signs ('+++ ' printed in green); a robust effect called 'Stroop interference'. This interference is the classic example of a task in which a relatively automatic, unintended cognitive process (word reading) conflicts

with a relatively controlled, intended cognitive process (color naming). As such, it has been the subject of numerous research projects (several hundreds) over the past half century (MacLeod, 1991). As noted by Besner, Stolz, and Boutilier (1997), the many variants of the Stroop task have been explored theoretically, empirically, and computationally by cognitive and developmental psychologists, psycholinguists, neuropsychologists, and cognitive scientists in more than 700 papers over the past 60 years. A core assumption of virtually all the theoretical accounts is that skilled readers process the irrelevant word without consciousness or intent. Reading the word is said to be automatic in the sense that readers cannot refrain from accessing the meaning of the word despite explicit instructions not to do so. As Anderson (1995) put it: "Reading is such an automatic process that it is difficult to inhibit and it will interfere with processing other information about the word". Apparently, even knowing about the Stroop effect is not protection (Reisberg, 1997), a point suggesting that the processes underlying this effect are not open to control. In our investigation, however, subjects working either in presence of relatively unpredictable audiences or in presence of a slightly superior coactor (a peer-confederate working faster than themselves on the Stroop task) were successful at inhibiting word reading, compared to those working alone. Let us briefly describe these experiments.

In the first series, it was assumed that audiences (i.e., passive spectators) can have effects on individuals regardless of any directional influences. Examples of these influences are the distribution of reinforcements, punishments, and feedback cues; the supplying of information; and the setting of norms and standards with which the participant feels obligated to comply. There is indeed evidence for the existence of "mere presence" (Zajonc, 1980) or passive audience effects, especially when there is some uncertainty about the behavior of the person present (Guerin, 1986). According to Guerin (1986), this uncertainty is especially high when the person present is a stranger and is not coacting, when he/she is sitting close to the individuals, doing nothing (compared with when individuals can see that the audience is engaged in a predictable activity), and when the audience cannot be monitored by the individuals. Our pilot studies (Huguet & al., 1999) tested whether social presence affects Stroop interference in these different conditions. Participants (all females) were faced with a computer version of the basic Stroop task alone and then in presence of a same sex confederate (social presence varied within subjects). In Study 1, the confederate sat opposite the participants, on the edge of their peripheral vision, and never looked at them. In Study 2, the confederate sat behind the participants and thus remained invisible. In Study 3, the confederate sat opposite the participants, as in Study 1, but watched them 60% of the time. As in previous research on mere presence (Guerin, 1983), the confederate was positioned in various ways as to not see the task. In Study 1 and Study 3, the confederate could not see the computer and, therefore, was unable to determine whether the participants had given correct or incorrect responses. In Study 2, the participant's body blocked the screen. Several criteria were also satisfied regarding the concept of "mere presence". Most notably, the confederate was supposedly naive to the nature of the experimental task, her presence was clearly incidental, there was no obvious emphasis on evaluation by the instructions or by the task, and participants were truly alone in the alone condition and not with the

experimenter partially concealed (the experimenter left the room during all Stroop trials both in the alone and social conditions).

As expected, participants were faster at identifying the letter color cues of incongruent color words when they worked in presence of relatively unpredictable (i.e., attentive or invisible) audiences than when they worked alone or in presence of a predictable (inattentive) audience. A test-retest study, in which participants performed the Stroop task twice in isolation, showed that this social facilitation effect was not due to the fact that a repeated measure design was used. Consistent with this, in another experiment (Huguet & al., 1999, Experiment 1), in which social presence varied between subjects (with males and females), participants working in presence of an attentive or invisible audience were again faster at identifying the letter color cues of the incongruent color words, compared with those working alone or in presence of an inattentive audience. In this new study, social facilitation of Stroop performance was accompanied by a significant reduction in recognition memory for the Stroop list words, exactly as one would expect if the critical social presence conditions did cause attention to focus on the letter color cues at the expense of participants' word reading tendency.

Huguet et al. (1999, Experiment 2) also explored this social-attentional phenomenon in coactive situations (participants were faced with the presence of peers working independently and simultaneously at the same task). Several studies have shown that coaction affects performance only when it makes sense for the participants to compare themselves with the coactor (Sanders, Baron, & Moore, 1978) or when the coactive situation makes social comparison unavoidable and relatively self-threatening (Rijsman, 1974; 1983; Seta, 1982; Seta, Seta, & Donaldson, 1991). In line with this, participants who were forced to engage in upward social comparison (i.e., who engaged in comparison with a coactor working faster than themselves on the Stroop task) were much faster at identifying the letter color cues of the incongruent color words, compared with those in three other conditions (i.e., those working alone, or those working either in presence of a similar coactor or in presence of a coactor slower than themselves). Likewise, participants' recognition of the Stroop list words was especially low in this critical condition, suggesting (once more) that attention affected Stroop interference at an early stage before response output.

As revealed by other recent findings (Huguet et al., in press, Study 1), real coaction is in fact not necessary for the present beneficial effect of upward comparison to occur. In this last study, participants were simply informed about how they performed on a Stroop-like task in comparison with previous participants and then they performed the Stroop task itself. Downward, lateral, and upward social comparisons were induced. Participants in the control group received no comparison information. The pattern of results was approximately the same as in Huguet et al.'s (1999) Experiment 2. Once more, participants faced with upward social comparison were especially successful at inhibiting word reading. They responded faster to the incongruent words without making more errors (e.g., responding "blue" for the word Blue flashed in red).

Thus, over the past sixty years, authors in the domain of the Stroop task have suggested that when they must identify the ink colors of incongruent color words, individuals cannot refrain from accessing the meaning of words despite explicit

instructions not to do so. Our findings, however, demonstrate the power of relatively simple social situations over what has been thought to be invariant automatic processing in the Stroop literature. Our first conclusion in this chapter, therefore, is : how people experience their social world, or what they come to believe about it, can play a significant role in determining primitive operations of cognition. Of course, future research is certainly needed to understand exactly how this social regulation operates. As such, however, our findings offer new reasons to "pay constant attention to the social environment of cognition" (Simon, 1990, p. 16). The findings reported below provide further support for this idea in the classroom setting, in which the presence of others and the comparisons associated with this presence are basic components.

#### SOCIAL COMPARISON CHOICES AND CLASSROOM PERFORMANCES

In a recent longitudinal field study, Blanton, Buunk, Gibbons, and Kuyper (1999) found that Dutch middle school children's performance in a variety of academic domains was more likely to improve if they reported that they compared their exam grades with other students in their classroom who performed slightly better than themselves (i.e., if they engage in upward comparisons). In this study, improved academic performance was also associated with higher comparative evaluations (i.e., how the children evaluated their relative standing in the classroom), which did not interact with participants' comparison-level choice, providing evidence that choices of comparison and comparative evaluations are independent predictors of performance outcomes in the classroom setting. Such findings are important for a number of reasons. First of all, until Blanton et al's study, the finding that upward comparison leads to better performance was essentially related to laboratory experiments in which participants have not been given a "choice" of different comparisons. Although the use of forced-comparison in the laboratory is certainly useful, it does not address the question of whether or not one's chosen level of comparison predicts performance. Second, the lack of research outside of the laboratory does leave open the question of whether comparison-level choice has meaningful effects on performance in daily life, especially in the school environment (Levine, 1983). By providing evidence for such effects, Blanton et al's (1999) study emphasized the pragmatic importance of investigating the relationship between comparison choice and performance level. Third, whereas several underlying mechanisms have been postulated for this relationship, it has been rarely investigated. Most social comparison theorists now agree that the tendency to compare upward is frequently associated with a desire for self-improvement (e.g., Wood, 1989; 1996), the reverse tendency (i.e., downward comparison) being probably due to self-enhancement needs in numerous situations (see Buunk & Gibbons, 1997; Gibbons, Blanton, Gerrard, Buunk, & Eggleston, 2000; Wills, 1981). Findings indicating the role of the self-improvement motive in the impact of comparison-level choice on performance are still missing, however. Furthermore, when the link between comparison-level choice and performance has been examined, comparison choices was assessed using only self-report (rather than actual comparisons). In contrast with this, an objective measure of comparison-level

choice (based on students' and comparison others' actual grades) was used in Blanton et al.'s (1999) study. Finally, that choice of comparison and comparative evaluation are independent predictors of performance is especially interesting. Not only is this consistent with Wood's (1996) suggestion that comparative evaluation does not always reflect social comparison *per se* but it also shows that choosing to compare upward does not necessarily lower self-evaluations (Buunk & Ybema, 1997; Collins, 1996).

Huguet, Dumas, Monteil, and Genestoux (2001) replicated and extended Blanton et al.'s (1999) study and found essentially the same pattern of results with French college students. As expected, most participants (i.e., children in their first year of secondary school) nominated comparison-targets in each course (7 courses overall) and chose same-sex students who were slightly outperforming them in class. Such results were consistent with those found in the original study and, therefore, provided further evidence that individuals often prefer comparisons with people who are performing slightly better than themselves (Arrowood & Friend, 1969; Gruder, 1971; Nosanchuk & Erickson, 1985; Suls & Tesch, 1978; Wheeler, 1966; Wilson & Benner, 1971; Ybema & Buunk, 1993) and with whom they share a meaningful identity or a close emotional bond (e.g., C.T. Miller, 1984; D.T. Miller, Turnbull, & McFarland, 1988). In our investigation, complementary data indeed revealed signs of close relationships between participants and their comparison targets. Tesser's (1988) Self-Evaluation Maintenance model suggests that upward comparison does not occur with close friends in self-relevant academic domains, in which this comparison could be perceived as self-threatening. In our investigation, however, upward comparison occurred with close friends both in self-irrelevant and in self-relevant academic domains, suggesting that individuals can engage in this comparison even when it is potentially self-threatening.

Two sets of seven standard regression analyses (one by academic domain) were also designed to predict change in grade over time as a function of comparative evaluation and comparison-level choice. In the first set, grade obtained at Trimester 2 (T2) was regressed on T2 comparative evaluation and T2 choices, controlling for T1 grade. These regressions tested for cross-sectional relationships between the two "comparison" measures and grade. In the second set, grade obtained at Trimester 3 (T3) was regressed on T2 comparative evaluation and T2 choices, controlling for T2 grade. These regressions tested for longitudinal change in grade as a function of prior social comparison. These two sets of regression analyses included two comparison level choices (i.e., choice 1 and choice 2) instead of only one. As in the original study, higher grades were predicted fairly consistently both by comparative evaluation and comparison choices. Likewise, choice of comparison and comparative evaluation were independent predictors of performance in our investigation, providing new evidence that choosing to compare upward does not necessarily lower self-evaluation. One might think that choosing to compare with another student who is doing well in school would drive comparative evaluations down as a result of the increased salience of successful others. This would be especially likely to happen in self-relevant domains when these successful others are close friends, as also suggested by Tesser et al. (1984). This negative impact of upward comparison on self-evaluation did not occur, however.

Thus, our second conclusion is that social comparison processes play a crucial role in the determination of individuals' cognitive functioning, especially in the school environment (see Huguet & Monteil, 1995 for an illustration of this role outside the school environment). Twenty-five years ago, Santrock and Ross (1975) pointed to the importance of social comparison as a factor liable to influence attention and performance even in kindergarten children ! This fascinating conclusion will not be followed by other developments, however. Of particular interest for the next section of this chapter, Santrock and Ross also suggested that the individuals' past social comparison episodes play a mediating role in the way they behave in actual social comparison situations. This is exactly what indicates our last category of findings, which provides the most direct evidence (among those reported in this chapter) that the social context in which cognitive functioning takes place is an integral part of that functioning, not just the surrounding context for it.

#### THE ROLE OF PAST SOCIAL EXPERIENCES

In a pilot study (Monteil, 1988, Study 1), students (adolescents from separate classrooms) with records of high and low achievement attended a standard biology lesson given by a teacher they did not know. In the first ("social comparison") condition, it was publicly announced that one-half of the students was in "Level 1" (i.e., level typical of the low achievers) and the other half in "Level 4" (i.e., level typical of the high achievers). This corresponded quite well to these students' academic status since, at that time, the French state education system was testing out "group levels", which involved dividing classes into relatively homogeneous groups with respect to students' various competences. In the second condition ("no comparison"), students were informed that the level was the same for everyone without mentioning, however, what that level was. In this condition, students were led to assume that the others belonged to the same academic level as themselves. The lesson was then given in two different situations involving either a high or a low level of social visibility expectation. Students were informed either that each one of them would be given an oral test during the lesson or that none of them would be tested (high vs. low expectation of public individuation). In fact, no questions were asked of any participant regardless of the conditions announced. Because of the size of the session groups ( $n = 8$ ), however, the probability that each student could very well be tested in the high social visibility context was maintained almost throughout the lesson (45 minutes). At the end of the session, the teacher commented that he or she had only a short amount of time to deal with questions. Immediately after the lesson, a written test composed of 10 questions was given to the students. This second phase also lasted 45 minutes. Each student's test was evaluated by four biology teachers in different orders to minimize evaluation biases. The average of the four marks obtained by each student on the written test constituted the dependent variable. The question thus was if, and to what extent students' performances would be sensitive to the manipulations of the learning conditions. Let's see.

Whatever their public individuation expectation may have been, participants in the no-comparison condition came up with performances consistent with their usual

academic status: high achievers performed very well, whereas low achievers performed poorly. Quite different results were observed in the social comparison condition. When faced with the possibility of a public individuation, high achievers succeeded much better than low achievers. When this possibility was eliminated, both types of students obtained similar performances. The high achievers also performed better when they expected to be individuated than when they did not. The opposite effect was observed among low achievers. These results seemed to show at least two things: (a) social comparison really did influence academic performances, and (b) this influence was modulated by the expectations of public individuation or social visibility in the classroom. At this stage, all that was needed was to replicate these effects to ensure their strength which was done in a another study (Monteil, 1988, Study 2).

In this second study, conducted only with high achievers, participants were randomly assigned to situations of failure or success (from a prior bogus task related to the experimental task). Once more, because of the public nature of this assignment, participants were forced to compare themselves with others in their session group. Individuation expectations (high vs. low) were also introduced. Once more, participants who received success feedback did much better in the individuation condition than those facing failure. The opposite effect was observed in the low individuation condition. While the performance of students in a situation of success proved to be better when they expected to be individuated than when they did not, the opposite effect was observed in students facing failure. This interaction between pre-performance feedback (success vs. failure) and public individuation expectation (high vs. low) provided a strong confirmation of the effects of the social context on individual cognitive activities. It suggested that performance outcomes depended neither on the sole intrinsic capacities of the participants (all were high achievers) nor on the task's own characteristics (it was the same for everyone) but rather on the context in which the participants worked. This context appeared to determine a particular relationship with the experimental task.

The part played in this relationship by the academic value of the task was also investigated (Monteil, 1988, Study 3). In this new study, the pre-performance feedback x public individuation interaction found in Study 2 was replicated. As expected, however, this interaction varied as a function of the prestige associated to the focal task. While the interaction only accounted for 8.74% of the variance in the case of a task related to Manual and Technical Education (MTE), it explained 22.79% of the variance with a task related to History and Geography, 59.90% with a task related to Biology, and 65.25% with a mathematical task! Thus, it seems that, as opposed to neutral or less valued disciplines, the more valued ones forced students to inscribe their conduct in the pattern of expectations generated by the school system. This suggested that the modification of an academic behaviour in a given discipline does not depend solely on the students' cognitive characteristics but also on the modification of the dominating cultural model (e.g., the hierarchy of academic disciplines) at a given time in a given society.

Further arguments for the role of task value in students' performances come from another study (see Monteil & Huguet, 1991), in which an identical task was presented in two different educational contexts (i.e., geometry vs. drawing). In this study, high

and low achievers were asked to learn a complex geometrical figure. Adapted from the Rey-Osterrieth's (1941) complex figure reproduction test, this figure did not hold any particular meaning. It was to be learned in a limited time (50 seconds) and immediately reconstructed from memory in a graphic form. Each student worked alone, whether in the phase of learning or of reconstruction of the figure. The experimental manipulation simply consisted in informing participants that the test allowed to adequately measure their ability in geometry versus their drawing skills. The free recall performance was taken as the dependent measure. Results showed a significant interaction between participants' academic level and the context of presentation of the task. As expected, the high achievers performed better in the somewhat prestigious context of geometry than in the less valued context of drawing. The opposite effect was found in low achievers. Of particular interest here, whereas the performance of both groups of participants appeared equivalent in the context of drawing, the low achievers performed less than the high achievers when the task was presented as diagnostic of their ability in geometry. The task being strictly the same in both contexts, this interaction reflected the role of the representations constructed by the students with regard to the context in which they performed the task (see Huguet, Brunot, & Monteil, 2001, for a recent replication of these findings).

Taken together, these findings suggested that students' past classroom experiences, in which social comparison episodes and recurrent evaluation of their skills were prominent otherwise crucial elements, played a major role in the way they reacted to their actual context of performance (see also Monteil & Michinov, 2001 for the role that past social experiences can play in social comparison choices). Most notably, it seemed that students' performance decreased when they were faced with unfamiliar or relatively self-threatening learning situations or when they received feedback inconsistent (rather than consistent) with their performance history. For example, when experimentally allotted a success and placed in a situation of low individuation or anonymity (a state opposed to what they were generally used to), the high achievers did not perform as well as in an individuation or public situation (a more familiar state, at least in France). It was therefore possible to consider situations conflicting with knowledge that students had about themselves (on the basis of prior social comparison experiences) as modifying the social conditions of their relationship to the object (i.e., the task) and at the root of the construction of a new meaning for the social situation. Quite often overlooked in the psychosocial literature, this role of self-knowledge and prior experiences encouraged to pursue the effort towards a better understanding of the way in which the manipulations modified cognitive functionings and performances.

In a new study (Monteil, 1991, Study 2), low achievers attended a math lesson which tackled a question new to everyone: Thales' Theorema. Following the example of Monteil's (1988) Studies 2 and 3, a pre-performance feedback was manipulated (randomly distributing success and failure) from a bogus task. Students were thus either faced with failure, a somewhat familiar situation, or conversely, with success, a new situation considering their past academic experience. Once more, the lesson was given in a condition of anonymity versus individuation. Following the lesson, students were to resolve a series of math problems making use of the newly acquired information. The pattern of results was totally opposite to that obtained by the high

achievers (those in Monteil's, 1988, Study 2). Indeed, these low achievers had high performances, unfamiliar to them, in a situation of low individuation and with a success label. Conversely, they performed poorly in a situation of individuation with this label. These students (who were presumably used to academic failure) appeared to behave as if they had difficulty publicly acknowledging (in a condition of individuation) a positive evaluation (success feedback) which, in a situation of low individuation, proved to be beneficial to their performances. It became therefore obvious that past psychosocial conditions --negative evaluations and comparisons all through their school years-- played a part in the management of the task's current social conditions. Combined with the previous ones, these results started to draw a more organized phenomenal picture. It thus seemed appropriate to inquire into the existence of mechanisms liable to account for, at least in part, the involvement of knowledge and situations related to the self in the production of cognitive performances. It could indeed be imagined that the social situations in which the participants found themselves played the part of a memory-retrieval cue for autobiographical elements possibly related to academic evaluative situations or to social comparisons induced by these situations. Implicitly or explicitly, these elements, and perhaps their emotional components, appeared liable to play a part in the participant's attentional abilities.

To test this autobiographical-attentional hypothesis, the same experimental paradigm as before was used while including an incidental task (see Monteil, Brunot, & Huguet, 1996). Let us briefly describe this more integrative experiment. High and low achievers attended a math lesson on Thales' Theorema in the by-now-familiar learning conditions (success vs. failure feedback and high vs. low individuation expectation). On their desk, in the top left corner, a sheet of paper was placed on which a series of small geometrical figures of various shapes and sizes were drawn. The participants' attention was never directed towards this particular feature of their work setting. The experiment ended with problem-solving tasks pertaining to Thales' theorema. Participants were then required to draw the geometrical figures displayed on their desk during the lesson (incidental task). Results related to the problem-solving task reproduced the phenomena usually observed. However, the main interest of this additional study did not lie in this confirmation but rather in the fact of providing, through the recall performances related to the incidental task, the first elements of a mechanism pertaining to the importance of personal history in the accomplishment of cognitive performances. Indeed, high achievers obtained their best recall score of geometrical shapes in what represented the most familiar situation for them, namely, the success feedback associated to the high individuation expectation. In this situation, the exact opposite occurred with low achievers, who obtained their poorest score. In contrast, the low achievers, "secured" with a failure and familiar feedback, performed high on the incidental task regardless of the individuation manipulation. Conversely, when faced with this feedback, high achievers obtained their lowest scores, especially when they expected to be individuated. Finally, when participants received a success feedback and were placed in a low individuation condition, no difference appeared between high and low achievers.

This body of results constituted an empirical foundation interesting enough to support the key idea pertaining to these last experiments, namely that the learning conditions in which students are placed can activate knowledge about the self related to past academic situations or events, which has specific consequences for their cognitive performances. Our suggestion is that the situations posed in these experiments appeared to the participant as more or less compatible with past academic elements. In other words, these elements seemed to match the representations of self and the autobiographical elements possibly forming these very representations. In the case of a strong incompatibility between the current situation and the activated past states or representations, the resulting “cognitive context of self” (Monteil & Huguet, 1999) represented for the participants a cognitive load and/or emotional characteristic liable to direct the use of their attentional ability.

Let us elaborate a little further. It seems that low achievers receiving a failure feedback, regardless of the individuation condition, were placed in a situation consistent with their academic past. The context, springing from this connection between “past” and “present” was thus so familiar that its processing did not appear cognitively costly. The low achievers were so used to situations of failure that a good share of their attentional ability was still available. Since it had not been captured by the problem to solve, nor had it been mobilized by the context fostered by the experimental device, the participants’ attentional ability had thus been free to process the geometrical figures present in their close physical environment (the desk). High achievers receiving a success feedback and placed in a situation of individuation also found a highly familiar and thus cognitively inexpensive context. All the other situations considered in this last experiment presented a more or less strong degree of incompatibility with contents from previous experiences or with the self-schemas which, by hypothesis, recorded them (see Martinot & Monteil, 1995 on the existence of academic self-schemas).

As expected, these situations seemed to bring about contexts requiring attentional abilities. Such was the case with low achievers receiving a success feedback and placed in a situation of individuation. Individuation, generally linked to failure, coupled here with a success feedback, presumably created a cognitive and no doubt emotional context requiring a lot of attention. Likewise, the scores of high achievers receiving a success feedback and placed in a situation of low individuation was a striking illustration of the cognitive load resulting from the relationship between a current context and autobiographical knowledge linked to past situations. Low individuation, being highly unusual for these high achievers more accustomed to socially visible successes, disturbed their self-representations thus prompting the emergence of a cognitive context of self requiring attention. This still raises questions about how low achievers, among those receiving success feedback and placed in a situation of low individuation, performed well on the problem-solving task. Indeed, although the low recall scores for peripheral geometrical figures did indicate the production of a context costly in attention, this cost was not important enough as to preclude a positive performance at the explicit task, quite the contrary. In contrast to what it produced in high achievers, the situation of low individuation put into perspective the context's cognitive load fostered by an unusual success feedback, allowing low achievers to enjoy a positive social comparison.

It seems difficult to ignore the phenomena of the sharing out of attention involved in the modification of the performances observed in Monteil et al.'s (1996) experiment. For this reason, Brunot, Huguet, and Monteil (2000) have also endeavoured to find out according to which mechanism attention could indeed play a part in the regulation of performances. In this more recent study, it was found that students receiving a feedback somewhat inconsistent with their usual performances focused a larger share of their attention on the self (i.e., increased self-focused attention) than did same-level students who either received no feedback whatsoever or a feedback quite consistent with their customary performances.

These results on the social regulation of classroom performances could no doubt have been interpreted otherwise. We should point out, however, that it was neither implausible nor totally inadequate to view them as illustrative of the involvement of elements related to the self and of autobiographical characteristics in the production of individuals' cognitive performances. While not altogether laying the foundations for a new theory, our data motivated us to develop systematic studies which, in turn, would offer more understanding about the social regulation of cognitive performances. But beyond cognitive social psychology *per se*, our main goal was to strive for a "social psychology of cognition".

#### TOWARDS A SOCIAL PSYCHOLOGY OF COGNITION

At the time of encoding and storage of much information, social and emotional experiences are closely linked to the individuals' corporal environment. There is good reason to believe that this idea is by no means absurd. Referring to Tulving's well-known work on episodic memory (1972, 1983), we know that what is stored in memory can correspond not only to the information *per se*, but also to the way that information was processed by the individuals. To the extent that cognition always takes place in a social context (see also Levine et al., 1993), the individuals' social and (probably interrelated) emotional experiences may have, therefore, a representational content and may be located in the realm of mental representations. Thomson and Janigian (1988) suggested that individuals cognitively represent their lives in terms of the events they experience, the goals they achieve, their failures, and their successes, forming, as it were, a life-schema which, like every schema, is assumed to act as a processing unit for incoming information. The notion of episodic memory is quite relevant here, for it reminds us that information is coded both temporally and in connection with the person actually doing the memory storing. It thus appears fair to think that one's personal history, which results from one's social history, is strongly imprinted in memory. For this reason, this history is easily activated and implemented in the form of a system of responses in the individual's behavioral repertoire. For this activation to occur, the individuals need only find themselves in the presence of certain inputs or certain sociopsychological configurations acting as retrieval cues for knowledge related to previous social experiences.

As noted by Monteil (1993a), if we agree with Tulving that what is stored in memory is not just information but also the way in which the information was processed and retained, we can reasonably assume that the individuals encode both

the information and its context. In the concept of “social individuals”, the context of that information is mostly composed of the social and emotional conditions in which they find themselves when faced with the information to be processed, or with the necessity of forming an attitude, devising a strategy, or making coherent their environment. In short, in a learning situation, individuals are always faced with the reality of a social context which accompanies the information to be processed. What is imprinted in memory is a representation which associates the context, or some of its characteristics, with certain rules or knowledge (or some of their characteristics). We could consider the possibility of processing this representational content separately, but to do so we would have to acknowledge the total independence of the information to be processed from the whole of which it is part! This hypothesis presupposes that the individuals are capable of cutting themselves off from their social environment, which is obviously difficult to carry out both on a neurophysiological as well as on a psychological level. Does this mean that, for the individuals, all information is always socially defined? Certainly, in our opinion, the problem of knowing if the information is processed first at the level of sensorial memory, that is to say, at early stages, or, indeed processed at the level of working memory, does not change anything regarding the basic fact that this information was encoded in a specific social situation. One must therefore contemplate the fact that the knowledge, the rules acquired by the individuals, and the processes which support this acquisition are constitutively dependent on the social conditions of their development. Thus, studying cognition in its social context may indeed help understand more precisely human cognitive activities (Huguet et al., 1999; Monteil, 1993a).

How should we approach the social context of cognition? Must one tackle the study in itself of this social context or rather approach it through the possible social determinants of its development, of its mechanisms, or of its forms of expression? The two things are quite different. In the first case, the problem raised would rather suggest a theoretical conception of an ecological type (Gibson, 1979), at the heart of which the behaviourists' stimuli would have gained the status of events. These events, even if they are considered as contexts for understanding and action (Schanck & Abelson, 1977), or as settings making the recall easier (Neisser, 1986; Nelson, 1986), are nevertheless difficult to delimit (Avrahami & Kareev, 1994). At times defined by the objects on which they are based (Quine, 1985), the causes which generate them and their effects, even by the goals guiding action, their limits remain hard to grasp. For this type of approach, the information is not in the mind but in the world and presents itself directly to the perceptual system through the ecological coherence of events. This is obviously a critical conception of the dominant cognitivism, close to a contextualist behaviourism (Hoffman & Nead, 1983).

In the second case, as implicit as it may be, the criticism of cognitive psychology is not absent but rests instead on other bases. By explicitly assigning a role to the social context in one's approach to cognition, this conception in a way conflicts with Minsky's (1985) famous society of mind. The representation of an individual cannot by any means be reduced to that of a solitary information processing machine. The fact that human cognition takes place in a cultural and social universe (Bruner, 1990), and that it expresses the result of both the processing and the integration into an environment which presents properties that the individuals place in memory along

with specific meanings (Monteil, 1993a), should thus not be neglected. To take into account and pay attention to individuals' motivations, as well as to their social interactions, real or symbolic, or to consider their past experiences, thus becomes an epistemological requirement. In such a conception, it is neither the events' ecological coherence or the sole transaction between their cognitive properties and the objective properties of such and such a task which determine the individuals' performances and actions. Instead, the guiding principle may be found in what the individuals came to believe, depending on their actual and past social experiences, about this task or object. It is thus indeed from a "social psychology of cognition" (Monteil, 1993b), not from the angle of a psychoecology, of a neobehaviourist contextualism, or even of a microsociology à la Goffman (1959, 1967), that one should approach the issue of the social context and deal with its possible influence on cognitive constructions and performances.

In short, conceiving humans from a psychosocial point of view means understanding them as historical individuals or as people endowed with memory. Individuals, indeed, are both actees and actors. The actions, options, and strategies in which they are involved do not include in themselves their reasons and explanations. In other words, no one makes choices freely and knowingly. However, neither are these choices directly imposed by the outside world through the positions that the individuals occupy in the different social fields. Rather, the individuals are directed both from the outside, by the specific situations and cultural norms and values to which they are faced with, and from the inside by their socially constructed and deeply rooted experiences of cognitive capacities, of world vision and division, of hierarchy, and of preferences. The links between the objective structures (those of the social contexts) and the incorporated structures (those of the individual's memory system) constitute in a way the basis of the individual's relationship to the object of knowledge. The latter, dependent on the former, being at the same time able to participate in their implementation as well as in their reproduction.

The social psychology of cognition, therefore, is neither required to merge with cognitive psychology nor must it become a microsociology. Its research area is the study of individuals who maintain social contacts, participate in social interactions, belong to social groups, and are the objects of categorizations, etc. It is indeed difficult to imagine that this set of characteristics can be held as negligible in the study of human cognitive functioning. It is, therefore, at a dual level of investigation of this functioning that social psychology must assume its scientific responsibility. It must continue to devote itself to studying the effects of basic social situations on human behaviour, such as the presence of others and social comparison situations, intergroup relationships, and the like, so that one can better identify the most basic and most cognitively salient social contexts for all human individuals. Fortified by this knowledge of the relationships between the individual and the collective, social psychology must promote and conduct a procedure aimed at grasping the study of human cognition by taking into account the autobiographical dimension of individuals, that is, their social and affective history which is a product of the contexts they face in their everyday lives. The aim of all this is to determine at what point cognitive operations can be socially regulated. This would show how psychological individuation is also the expression and the result of the processing and the integration

of the social environment stored in memory by means, particularly, of the cognitive and neurophysiological competences specific to the human species. As noted by Monteil and Huguet (1999), since these concerns are not necessarily of interest to other fields of scientific psychology, the social psychology of cognition can therefore draw from them reasons to assert a unique contribution.

## REFERENCES

- Anderson, J. (1995). Cognitive psychology and its implications. New-york: Freeman.
- Arrowood, A. J. & Friend, R. (1969). Other factors determining the choice of a comparison other. Journal of Experimental Social Psychology, *5*(2), 233-239.
- Avrahami, J., & Kareev, Y. (1994). The emergence of events. Cognition, *53*, 239-261.
- Besner, Stolz, J.A., & Boutilier, C. (1997). The Stroop effect and the myth of automaticity. Psychonomic Bulletin & Review, *4*, 221-225.
- Blanton, H., Buunk, B.P., Gibbons, F.X., & Kuyper, H. (1999). When better-than- others compare upward : Choice of comparison and comparative evaluation as independent predictors of academic performance. Journal of Personality and Social Psychology, *76*, 420-430.
- Bruner, J. (1990). Acts of Meaning. Massachussets: Harvard University Press.
- Brunot, S., Huguet, P., & Monteil, J.M. (2000). Performance Feedback and Self-Focused Attention in the Classroom: When Past and Present Interact. Social Psychology of Education, *3*, 277-293.
- Buunk, B.P., & Gibbons, F.X. (1997). Health, coping, and well-being: Perspectives from social comparison theory. Hillsdale, NJ: Erlbaum.
- Buunk, B.P., & Ybema, J.F. (1997). Social comparison and occupational stress: The identification-contrast model. In B.P. Buunk & F.X. Gibbons (Eds.), Health, coping and well-being: Perspectives from social comparison theory (pp.359-388). Hillsdale, NJ: Erlbaum.
- Collins, R. (1996). For better or worse: The impact of upward social comparison on self-evaluations. Psychological Bulletin, *119*, 51-69.
- Crockenberg, S. & Bryant, B. (1978). Socialization: The "implicit curriculum" of learning environments. Journal of Research and Development in Education, *12*, 69-78.
- Devine, P.G., Hamilton, D.L., & Ostrom, T.M. (1994). Social cognition: Impact on social psychology. San Diego: Academic Press.
- Evans, E. (1993). On the relation between cognitive psychology and social cognition. In M.F. Pichevin, M.C. Hurtig, & M. Piolat (Eds.), Studies on the self and social cognition (pp. 220-230). London: World Scientific.
- Fiske, S.T., & Taylor, S.E. (1991). Social cognition. Singapore: McGraw-Hill.
- Forgas, J.P., Williams, K.D. & Wheeler, L. (Eds., 2000), The Social Mind: Cognitive and motivational aspects of interpersonal behavior. Cambridge: Cambridge University Press.
- Gibbons, F.X., Blanton, H., Gerrard, M., Buunk, B., & Eggleston, T. (2000). Does social comparison make a difference? Optimism as a moderator of the relation between comparison level and academic performance. Personality and Social Psychology Bulletin, *26*, 637-648.
- Gibson, J.J. (1979). The ecological approach to visual perception. Boston: Houghton Mifflin.
- Goffman, E. (1959). The presentation of self in everyday life. Garden City, New-York: Doubleday.
- Goffman, E. (1967). Interaction ritual. Garden City, New-York: Doubleday.
- Gruder, C.L. (1971). Determinants of social comparison choices. Journal of Experimental Social Psychology, *7*, 473-489.
- Guerin, B. (1983). Social facilitation and social monitoring: A test of three models. British Journal of Social Psychology, *22*, 203-214.
- Guerin, B. (1986). Mere presence effects in humans: A review. Journal of Experimental Social Psychology, *22*, 38-77.
- Guerin, B. (1993). Social Facilitation. Cambridge: Cambridge University Press.
- Hoffman, R.R., & Nead, J.M. (1983). General contextualism, ecological science and cognitive research. Journal of Mind and Behavior, *4*, 507-534.
- Huguet, P., Brunot, S., & Monteil, J.M. (2001). Geometry versus drawing: Changing the meaning of the task as a means to change performance. Social Psychology of Education, *4*, 219-234.

- Huguet, P., Dumas, F., & Monteil, J.M. (in press) Effets de Présence d'Autrui, de Coaction et de Comparaison Sociale dans la Tâche de Stroop: L'Environnement Social au Secours de la Cognition [Effects of social presence, coaction, and social comparison in the Stroop task: When the social environment comes to the aid of cognition]. In Beauvois, J.L., Joule & J.M. Monteil (Eds.), Perspectives Cognitives et Conduites Sociales (Vol.8). Rennes: Presses Universitaires de Rennes.
- Huguet, P., Dumas, F., Monteil, J.M. & Genestoux, N. (2001). Social comparison choices in the classroom: Further evidence for students' upward comparison tendency and its beneficial impact on performance. European Journal of Social Psychology, *31*, 557-578.
- Huguet, P., Galvaing, M.P., Dumas, F., & Monteil, J.M. (2000). The social influence of automatic responding: Controlling the uncontrollable. In J.P. Forgas, K.D. Williams, & L. Wheeler (Eds.), The Social Mind: Cognitive and motivational aspects of interpersonal behavior (vol.2, pp. 371-388). Cambridge: Cambridge University Press.
- Huguet, P., Galvaing, M.P., Monteil, J.M., Dumas, F. (1999). Social presence effects in the Stroop task: Further evidence for an attentional view of social facilitation. Journal of Personality and Social Psychology, *77*, 1011-1025.
- Huguet, P., & Monteil, J.M. The influence of social comparison with less fortunate others on task performance: The role of gender motivations or appropriate norms. Sex Roles *33*, 753-765.
- Levine, J.M. (1983). Social comparison and education. In J.M. Levine & M.C. Wang (Eds.), Teacher and student perception: implications for learning (pp. 29-56). Hillsdale, NJ: Erlbaum.
- Levine, J.M., Resnick, L.B., & Higgins, E.T. (1993). Social foundations of cognition. Annual Review of Psychology, *44*, 585-612.
- MacLeod, C.M. (1991). Half a century of research on the Stroop effect: An integrative review. Psychological Bulletin, *109*, 163-203.
- Martinot, D., & Monteil, J.M. (1995). The academic self-schema: an experimental illustration. Learning and instruction, *5*, 63-76.
- Miller, C.T. (1984). Self-schemas, gender, and social comparison: A clarification of the related attributes hypothesis. Journal of Personality and Social Psychology, *46*, 1222-1229.
- Miller, D.T., Turnbull, W., & McFarland, C. (1988). Particularistic and universalistic evaluation in the social comparison process. Journal of Personality and Social Psychology, *55*, 908-917.
- Minsky, M. (1985). The Society of Mind. New York: Simon and Schuster.
- Monteil, J.M. (1988). Comparaisons sociales, stratégies individuelles et médiations sociocognitives: Un effet de différenciation comportementale dans le champ scolaire. [Social comparisons, individuals strategies, and sociocognitive mediations: An effect of behavioral differentiation at school]. European Journal of Psychology of Education, *3*, 3-19.
- Monteil, J.M. (1991). Social Regulations and Individual cognitive function: effects of individuation on cognitive performance. European Journal of Social Psychology, *21*, 225-37.
- Monteil, J.M. (1993a). Soi et le contexte: Constructions autobiographiques, insertions sociales et performances cognitives [Self and the context: Autobiographical constructions, social integration, and cognitive performances]. Paris: A. Colin.
- Monteil, J.M. (1993b). Towards a social psychology of cognition. In M.C. Hurtig, M.F. Pichevin & M. Piolat (Eds.), Self-concept and social cognition. Singapour: Scientific Writing.
- Monteil, J.M., Brunot, S., Huguet, P. (1996). Cognitive performance and attention in the classroom: An interaction between past and present academic experiences. Journal of Educational Psychology, *88*, 242-248.
- Monteil, J.M., & Huguet, P. (1991). Insertion sociale, catégorisation sociale et activités cognitives [Social context, social categorization and cognitive performance]. Psychologie Française, *36*, 35-46.
- Monteil, J.M., & Huguet, P. (1999). Social context and cognitive performance: Towards a social psychology of cognition. London: Psychology Press.
- Monteil, J.M., & Michinov, N. (2000). Effects of context and performance feedback on social comparison strategies among low-achievement students: Experimental studies. Current Psychology of Cognition, *19*, 513-531.
- Neisser, U. (1986). Nested Structure in autobiographical memory. In D.C. Rubin (Ed.), Autobiographical memory. Cambridge: Cambridge University Press.
- Nelson, K. (1986). Event knowledge. Hillsdale, Nj: Erlbaum.
- Nosanchuk, T.A., & Erickson, B.H. (1985). How high is up? Calibrating social comparison in the real world. Journal of Personality and Social Psychology, *48*, 624-634.
- Nye, J.L., & Brower, A.M. (1996). What social about social cognition? Thousand Oaks: Sage Publication.

- Quine, W.V.O. (1985). Events and reification. In E. LePore & P.P. McLaughlin (Eds.), Actions and events: Perspectives on the philosophy of Donald Davidson. Oxford: Blackwell.
- Reisberg, D. (1997). Cognition: Exploring the science of mind. New-York: Norton.
- Rijdsman, J. (1974). Factors in social comparison of performance influencing actual performance. European Journal of Social Psychology, 4, 3, 279-311.
- Rijdsman, J. (1983). The dynamics of social competition in personal and categorical comparison-situations. In W. Doise & S. Moscovici (Eds.), Current issues in European Social Psychology (vol. 1, pp. 279-312). London: Wiley.
- Sanders, G.S., Baron, R.S., & Moore, D.L. (1978). Distraction and social comparison as mediators of social facilitation effects. Journal of Experimental Social Psychology, 14, 291-303.
- Santrock, J.W., & Ross, M. (1975). Effects of social comparison on facilitative self-control in young children. Journal of Educational Psychology, 67, 193-197.
- Schank, R.C., & Abelson, R.P. (1977). Scripts, plans, goals and understanding. Hillsdale, NJ: Erlbaum.
- Seta, J. J. (1982). The impact of comparison processes on coactors' task performance. Journal of Personality and Social Psychology, 42, 281-291.
- Seta, J.J., Seta, C.E., & Donaldson, S. (1991). The impact of comparison processes on coactors' frustration and Willingness to expend effort. Personality and Social Psychology Bulletin, 17, 560-568.
- Simon, H. (1990). Invariants of human behavior. Annual Review of Psychology, 41, 1-19.
- Stroop, J.R. (1935). Studies of interference in serial-verbal reaction. Journal of Experimental Psychology, 18, 643-662.
- Suls, J.M., & Tesch, F.E. (1978). Students' preferences for information about their test performance: A social comparison study. Journal of Applied Social Psychology, 8(2), 189-197.
- Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. In L. Berkowitz, Advances in experimental social psychology (pp. 181-227). San Diego, CA: Academic Press.
- Tesser, A., Campbell, J., & Smith, M. (1984). Friendship choice and performance: Self-evaluation maintenance in children. Journal of Personality and Social Psychology, 46, 561-574.
- Thomson, S.C., & Janigian, A.S. (1988). Life schemes: A framework for understanding the search of meaning. Journal of Social and Clinical Psychology, 7, 260-280.
- Tulving, E. (1972). Episodic and semantic memory. In E. Tulving, & W. Donaldson (Eds.), Organization of Memory. New York: Academic Press.
- Tulving, E. (1983). Elements of episodic memory. Oxford: Oxford University Press.
- Wheeler, L. (1966). Motivation as a determinant of upward comparison. Journal of Experimental Social Psychology, 2, (suppl. 1), 27-31.
- Wills, T. A. (1981). Downward comparison principles in social psychology. Psychological Bulletin, 90, 245-271.
- Wilson, E.S.R., & Benner, L.A. (1971). The effects of self-esteem and situation upon comparison choices during ability evaluation. Sociometry, 34, 381-397.
- Wood, J.V. (1989). Theory and research concerning social comparisons of personal attributes. Psychological Bulletin, 106, 231-248.
- Wood, J. V. (1996). What is social comparison and how should we study it?. Personality and Social Behavior Bulletin, 22, 520-537.
- Ybema, J.F., & Buunk, B.P. (1993). Aiming at the top? upward social comparison of abilities after failure. European Journal of Social Psychology, 23, 627-645.
- Zajonc, R.B. (1980). Compresence. In P.B. Paulus (Ed.), Psychology of group influence (pp. 35-60). Hillsdale, NJ: Erlbaum.

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