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Original communications

Rewards characteristics and intrinsic motivation: An exploratory study on homeostatic mechanisms

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A limited number of studies have addressed the effects of pay characteristics on both intrinsic and extrinsic types of motivations within an organizational setting. While the relationships have been documented in a number of studies, research has been confined to academic and laboratory settings, and a number of key questions remain unanswered. Based on a sample of 400 employees from a large Swiss financial institution, quantitative and qualitative results show that material rewards have no unilateral effect on intrinsic/extrinsic and total motivation. Instead, homeostatic mechanisms keep the intrinsic/extrinsic and total motivational level from varying beyond an equilibrium, while the structure of motivations among employees differs significantly depending on pay characteristics. A new conceptualization of motivational phenomena is presented.

Key words: Motivation, rewards, homeostasy, coping

In order more fully to understand the complex effects that material rewards strategies such as base salaries and bonuses have on employee motivation, researchers must utilize designs that encompass the unique characteristics of organizational settings. Thus far, we have largely attempted to generalize from research conducted within laboratory and academic settings. Furthermore, the research has been mostly confined to investigations of intrinsic motivations and has not tended to consider both intrinsic and extrinsic types simultaneously. This study attempts to overcome these shortcomings by exploring the effects of material rewards on both intrinsic and extrinsic motivations within an organizational setting.

The relationship between organizational rewards systems and motivation has been extensively studied from the Cognitive Evaluation Theory (CET) framework[1]. CET is based on the assumption that when individuals feel competent or perceive their actions are self-determined, this increases their intrinsic motivation (deCharms, 1968; Deci, 1975). Consequently, intrinsic motivation is often indirectly measured by the degree of autonomy that an individual feels. Many studies have focused on possible moderators of these perceptions of competence and au-

1 CET refers to a motivational construct that is halfway between the distal and the proximal poles in terms of conceptual proximity to action (see Kanfer, 1994, 4). The measured psychological characteristics are thus intermediate, between trait and state. They include a dimension of plasticity and adaptation, but also the necessary stability to be studied over time.

tonomy, such as feedback, goal assignment, and modeling, and, ultimately, how this influences intrinsic motivation (Kanfer, 1991, 1994). Several noteworthy studies have focused specifically on how rewards influence subjects' intrinsic interests in performing tasks (Deci, 1971, 1972, 1975; Lepper, Greene, & Nisbett, 1973) and the results have provoked extensive debate about the nature of motivation.

Specifically, Deci theorized that receiving an extrinsic reward for completing an intrinsically motivated activity shifts an individual's perceived locus of causality from internal to external. Furthermore, he asserted that this results in a reduction in intrinsic motivation for the activity since the individual would now perceive "the external reward to be the cause of their behavior" (Kanfer, 1991: 88). The depletion in intrinsic motivation due to the presence of an external reward was termed an *overjustification effect* (Lepper et al., 1973). Based on attribution (Kelly, 1967) and self-perception (Bem, 1972) theories, Lepper et al. speculated that, in the presence of rewards, people attribute their behaviors to this external source and future motivation and performance decreases. When the rewards are removed, future motivation and performance decrease. However, when there are no obvious external controls, the behavior is attributed to internal causes, and motivation and performance are not affected.

Numerous studies have confirmed the presence of an overjustification effect (Rummel & Feinberg, 1988; Tang & Hall, 1995), but very few have been conducted in practical settings, and their conclusions do not generalize to organizational settings. In fact, many of these studies are based on deductive experiments in so called "free-choice periods" in which intrinsic motivation is inferred from the time that participants freely allocate to a task (e.g., Deci, 1971, 1972; Fabes, 1987; Greene & Lepper, 1974; Lepper et al., 1973; Pittman, Emery, & Boggiano, 1982; Ross, 1975). Such a design does not account for the explicit or subtle coercion of employee behaviors that is inherent in most organizations. This assertion is supported by a meta-analysis (Wiersma, 1992) which concluded that the moderator effect of extrinsic rewards occurs only when intrinsic motivation is operationalized as task behavior during a free-time measure.

Subsequent developments in CET indicate that the extent to which rewards undermine intrinsic motivation seems to be influenced by perceptions of how "controlling" or "informative" the reward is (Deci & Ryan, 1985). For instance, when an individual is guaranteed to receive a reward prior to performing an activity, the reward is construed as controlling. This, in turn, decreases intrinsic motivation. On the other hand, when rewards are contingent upon the level of performance, perceptions of self-determination depend on the performance demonstrated in the activity. If the individual performs well, the reward is perceived as informational, but if the standards are not attained, it is perceived as controlling.

Rarely have these aspects been tested in organizations. As revealed in several meta-analyses (Cameron & Pierce, 1994; Rummel & Feinberg, 1988; Tang & Hall, 1995; Wiersma, 1992), many of these experiments take place in academic settings and the administration of rewards is carefully controlled. Under these circumstances, the studies do not mirror the complexity of organizational reward systems. Yet, the manner in which rewards are distributed and the situations surrounding their distribution are crucial considerations when studying overjustification mechanisms. Consequently, it is not clear how applicable these results are to complex organizations.

Further limitations to the overjustification effect have recently been exposed by questions from the behaviorist perspective on motivation (Cameron & Pierce, 1994, 1996; Eisenberger & Cameron, 1996). Specifically, to what degree do extrinsic rewards undermine intrinsic motivation? A meta-analysis of 96 experimental designs in school settings has suggested that there is, in fact, "no detrimental effect on intrinsic motivation" (Cameron & Pierce, 1994: 394). Behaviorists offer an alternative to CET, namely the existence of a *reinforcement effect* rather than an overjustification effect. They assert that extrinsic rewards can be used to maintain or even enhance a subject's intrinsic motivation for performing a task. They note that verbal rewards produce an increase in intrinsic motivation, that tangible rewards produce no effect when they are delivered unexpectedly, and that tangible rewards are not detrimental when they are expected and contingent upon the level of performance or the completion of a task. Furthermore, when the type of reward was not controlled, tangible rewards did not lead to a decrease in intrinsic motivation *under any conditions.*

The behaviorist perspective raises important limitations. However, in addition to the fact that its methodology and results have been criticized by supporters of CET (Kohn, 1996; Lepper, Keavney, & Drake, 1996; Ryan & Deci, 1996), the research emanating from this approach has been largely conducted within academic settings and faces the same difficulties as CET studies in its generalizability to complex work environments. The result is that research underestimates the potential impact of actual material rewards. In fact, the complete arsenal of extrinsic organizational rewards (salary, bonuses, promotions, hierarchical power, etc.) seldom arises in laboratory or school settings. Consequently, the effects of extrinsic rewards on intrinsic motivation in work settings are notably under evaluated.

There is thus clearly a need for further investigations. Moreover, research has mostly measured intrinsic moti-

vation using surveys based on the Intrinsic Motivation Inventory (Plant & Ryan, 1985; Ryan 1982; Ryan, Mims, & Koestner 1983). Only a few researchers have to our knowledge operationalized and measured both types of motivation in an organizational context (Amabile, Hill, Hennessey, & Tighe, 1994, 1995; Blais, Brière, Lachance, Riddle, & Vallerand, 1993). Hence, most of the experiments described are generally confined to intrinsic motivation only, leaving the extrinsic side neglected.

Consequently, a crucial question for all organizations has been rather neglected: "how do extrinsic rewards affect intrinsic *and* extrinsic motivation?" Is there a detrimental effect of material rewards on intrinsic motivation that is counterbalanced by a positive impact on extrinsic motivation? Do the inconsistent research results implicate the existence of an equilibrium-like mechanism that compensates for variations between the two types of motivation? What happens to intrinsic motivation when both contingent (bonuses) and non-contingent (base salary) types of rewards are offered simultaneously, as in most companies? Does the size or the variability of these two types of rewards determine the degree to which intrinsic motivation is diminished?

In order to begin to answer these questions, we considered the following: first, under which conditions do extrinsic rewards affect intrinsic motivation in complex organizational settings? Next, what are the effects of extrinsic rewards on extrinsic motivation? This study thus addresses the following critical question raised by the behaviorists (Cameron & Pierce, 1994), "What are the overall effects of reward characteristics on intrinsic motivation in an organizational setting?" In other words, do the characteristics of the material rewards predict these effects without involvement of an intervening variable, namely "the manner in which the reward is administered"? Furthermore, since research in CET has largely neglected the effects of material rewards on the extrinsic motivation, we ask, "are the positive or negative effects of rewards on intrinsic motivation compensated by respectively negative or positive effects on extrinsic motivation?"

To answer these questions, we focused on two types of organizational rewards: amount of base salary and amount of bonus. In accordance with CET, we have not assumed it is the characteristics of the rewards per se that influence intrinsic motivation, but perceptions of the degree of autonomy and self-determination associated with them. In an organizational context, it is difficult to measure such perceptions and the factors affecting them directly (the manner in which rewards are administered, and the situations surrounding their administration). Therefore, we focus on how the type and size of organizational incentives, via perceptions of autonomy and competence, are related to variations in intrinsic and extrinsic motivation.

Given our research questions and the assumptions of CET, we hypothesize the following effects:

H 1: Base salary will be negatively related to intrinsic motivation
If explanations from CET hold, the base salary, which is not contingent upon performance, should have a detrimental effect on intrinsic motivation. If behaviorist explanations hold, then tangible rewards produce no negative effect when they are expected and delivered upon completing or solving a task. This hypothesis also addresses the problem of the proportionality between the amount of the base salary and the level of intrinsic motivation. We posit that the degree of self-determination is inversely proportional to the amount of base salary and that consequently so is the level of intrinsic motivation.

H 2: The amount of bonus will be positively related to intrinsic motivation
Adherents to CET would predict that the higher the bonus, the higher the informational properties of the reward and therefore the stronger will be feelings of competence. Thus, intrinsic motivation should not decrease, and may perhaps even increase. From a behaviorist perspective, the conclusions are less equivocal: as the bonus is tangible and bound to performance level, it should raise intrinsic motivation. The principle of proportionality between the amount of bonus and the level of self-determination and intrinsic motivation is also presumed here.

H 3: Positive variations in intrinsic motivation are compensated by negative modifications of extrinsic motivation (and the reverse)
Our hypothesis is that when rewards have a negative impact on intrinsic motivation, equilibrium and compensation effects occur between the intrinsic and extrinsic categories. Positive effects on the composition of extrinsic motivation will compensate for the decrease in intrinsic motivation. Equilibrium mechanisms will then leave the overall motivation unchanged.

Method

Sample

The sample was composed of 400 randomly selected Swiss bank employees. All pay and hierarchical levels were represented in the sample. 66% were men and 33% were women, 57% were employees and 43% were managers. The average age was 37.8 years and the average tenure was 13.1 years. To insure the highest level of subject involvement and response rate, questionnaires were

administered face-to-face in isolated rooms within the work setting. The first 10 minutes of the interview were used to reassure participants that the interviews were confidential and to explain the purpose of the survey. Subjects were then left for 20 to 30 minutes to fill out the survey. After completion, we met again for a debriefing discussion of 15 to 45 minutes. 386 inventories were correctly filled and useable. Respondents omitted their names from the questionnaire to preserve confidentiality. However, through the individual encounter methodology, numerical codes were used to link the survey data to their personal and organizational salary variables. We also communicated the results of the survey to all participants in small ad-hoc groups 6 months after the survey.

Measurement: Compensation

We measured two independent variables relative to the pay attributes: the amount of the yearly base salary and the amount of the yearly bonus. In order to reduce the scale intervals, the amount of pay and bonus were transformed according to their logarithm function. Employees who were not eligible or who did not earn a bonus were assigned a bonus amount of one Swiss franc. From the 386 eligible employees, 167 received a bonus (42%). The mean leverage effect (Bonus/Base Salary + Bonus) is 2.7% for the overall sample, and 6.4% for the recipients.

Motivation: quantitative measures

As a foundation, we used the Blais' questionnaire on motivation (Blais et al., 1993), see also Blais & Lachance (1995) for its psychometric properties. It consists of 31 items measuring sub-types of intrinsic and extrinsic motivation. We pre-tested it in a series of semi-structured interviews with 30 people. It appeared early on that this instrument was not ideally suited to our needs and to the Swiss banking environment. Because of the length, the following modifications were necessary to reduce the number of items to a total of 15. This was achieved in the following manner:

- The original questionnaire was composed of several intrinsic intermediates types that were not acknowledged in the pre-test. We consequently collapsed them into one general category called "Intrinsic Motivation by Accomplishment".
- We removed the intermediate type labeled "Amotivation" because, in a work setting, the items related to this category were subject to a social desirability bias.
- We added 2 intermediate types, "Intrinsic Motivation

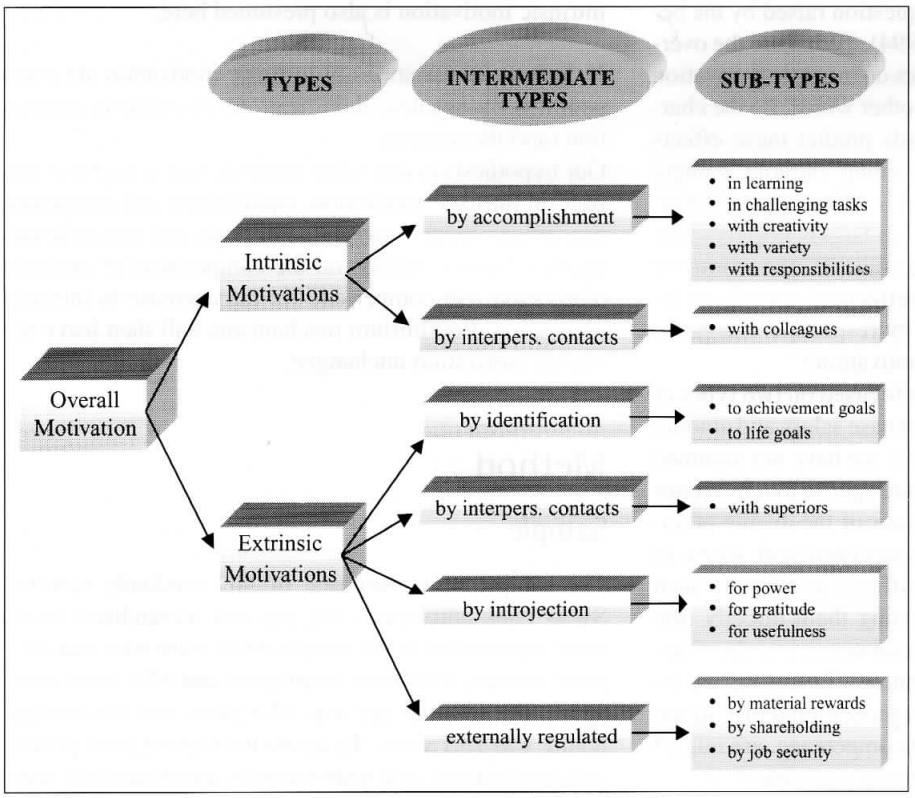

Figure 1: Motivational Model.

by Interpersonal Contacts" and "Extrinsic Motivation by Interpersonal Contacts", each with a corresponding sub-type, to reflect the social dimension of motivation which was absent from the Blais et al. (1993) instrument.
- Some additional sub-types were identified during the pre-test phase which necessitated the inclusion of 3 additional items to our model and survey: "Creativity", "Gratitude" and "Shareholding".

As a result, the composite model of intrinsic/extrinsic motivation we propose includes 15 sub-types, 6 intrinsic and 9 extrinsic.

The 15 sub-types are operationalized as follows (see Appendix A): (1) *Learning* as motivation for discovering and knowing new things; (2) *Challenging Tasks* as motivation for taking up demanding tasks; (3) *Creativity* as motivation for exercising one's originality at work; (4) *Variety* as motivation for executing a diverse mix of tasks; (5) *Responsibilities* as motivation for assuming charges; (6) *Contacts with Colleagues* as motivation for social interactions with colleagues; (7) *Achievement Goals* as motivation for feeling successful in one's professional life; (8) *Life Goals* as motivation for attaining career-related objectives; (9) *Contacts with Superiors* as motivation for superiors' recognition and support; (10) *Power* as motivation for playing an influential role in a group; (11) Gratitude as motivation for earning an organization's recognition for one's efforts; (12) *Usefulness* as motivation for the feeling that one's efforts contribute to the functioning of the group; (13) *Material Rewards* as motivation for the receipt of tangible recompenses; (14) *Shareholding* as motivation for serving as an owner of stock in the company; (15) *Job Security* as motivation in the desire to keep one's job.

Each of the sub-types was then classified according to its degree of self-determination (Blais et al., 1993). Intrinsic/extrinsic motivations were related to sub-types in which subjects exhibit respectively higher/lower degrees of autonomy. We clustered motivational sub-types into the following intermediate types: (1) *intrinsic motivations by accomplishment* correspond to non-social activities performed for their own pleasure and satisfaction; (2) *intrinsic motivations by interpersonal contacts* are social activities performed for their own pleasure and satisfaction for social interactions at one's own hierarchical level; (3) *extrinsic motivations by identification* correspond to activities performed for instrumental purpose, but adopted with feelings of self-determination; (4) *extrinsic motivations by interpersonal contacts* are those instrumental activities in which social contacts at hierarchical levels above one's own occur; (5) *extrinsic motivations by introjection* are coded to activities in which the motivation is extrinsic, but individuals impose pressures on themselves to execute the activity; (6) *extrinsic motivations externally regulated* are those that are performed primarily for rewards or to avoid punishment. The measurement scale is a 7 point Likert-type ordinal scale. Each motivational sub-type is presented in a sentence and rated on a dimension running from "I don't agree at all" to "I totally agree" (see Appendix A).

Motivation: qualitative measures

A second part of the study was qualitative in nature and was aimed at letting people freely explain their three most important sources of motivation. All listed motivations were classified and compared to the 15 sub-types of our theoretical model. First, the qualitative data has been used as a methodological precaution: in cataloguing all the open-ended remarks, we are able to assert, post-hoc, the comprehensiveness of our motivational model. Second, this inventory can be compared to the quantitative results, thus making possible analysis of our hypothesis with a second independent set of data.

Results

We first tested the normality of our distribution with positive results (Kolmogorov-Smirnov D = .044, p = n.s.). We then confirmed the internal consistency and reliability of the questionnaire with Cronbach's alpha and a split-half test (respectively .83 and .86). To ensure the survey was all encompassing and representative of subjects motivational structure, we performed a content analysis on the 1002 remarks collected in the qualitative part of the questionnaire (average of 2.6 per subject). 743 of them could be directly linked to one of the 15 motivational sub-types. Of the remaining 259, 138 were not applicable to the entire sample (e.g. motivation for contact with customer) and 121 were scattered, non-clusterable observations. Finally, 89 remarks were collected under the label "motivation for autonomy in working", which is emerging as a potentially new sub-type. Consequently, our model and corresponding questionnaire matched the motivations expressed in the qualitative responses remarkably well.

To verify that the data reflects the intrinsic/extrinsic dimensions postulated in the model, we first performed Spearman correlations (appropriate for ordinal data) for the 15 motivational sub-types.

We also investigated the model with the Multidimensional Scaling technique. The results (Stress = .11 and Alienation = .14) supported our intrinsic/extrinsic dimensional assumptions. As these results were similar to a subsequent Factor Analysis (Principal Components, Varimax

Table 1: Mean, SD, and Spearman Correlations for the 15 Motivational Sub-Types

(N = 386)	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1 Creativity	4.41	1.62															I
2 Variety	5.44	1.35	0.35														N
3 Learning	5.02	1.37	0.31	0.51													T
4 Respons.	4.72	1.57	0.46	0.43	0.35												R
5 Challeng.	4.94	1.54	0.53	0.34	0.41	0.53											I
6 Colleagues	5.32	1.33	0.16	0.34	0.17	0.28	0.21										N.
7 Achievmt	5.26	1.53	0.26	0.24	0.31	0.25	0.38	0.09									E
8 Life goals	4.22	1.75	0.19	0.20	0.34	0.31	0.40	0.05	0.51								X
9 Superiors	5.11	1.37	0.33	0.38	0.37	0.52	0.44	0.35	0.26	0.30							T
10 Power	4.22	1.69	0.36	0.23	0.21	0.47	0.42	0.22	0.40	0.23	0.28						R
11 Gratitude	4.83	1.42	0.23	0.21	0.18	0.36	0.35	0.36	0.62	0.18	0.22	0.37					I
12 Usefulness	5.29	1.21	0.27	0.29	0.28	0.31	0.38	0.33	0.36	0.24	0.22	0.41	0.33				N
13 Rewards	4.22	1.63	0.06	0.16	0.09	0.15	0.11	0.18	0.20	0.09	0.12	0.24	0.26	0.32			S
14 Sharehold.	2.50	1.62	0.12	0.13	0.17	0.12	0.20	0.10	0.28	0.26	0.25	0.28	0.29	0.30	0.37		I
15 Security	4.48	1.83	–0.14	–0.01	–0.04	–0.15	–0.11	0.04	0.04	0.13	0.05	0.07	0.09	0.17	0.40	0.24	C

Correlations > .169 are significant at p < .001

raw, cumulated eigenvalues = 7.95, proportion of explained variance = .53), we demonstrated post-hoc that the scale was perceived as interval.

We performed a confirmatory factor analysis on the 15 motivational items to evaluate the six-factor solution (Intermediate Types) of our theoretical model. We followed Bollen's (1989) recommendation to interpret multiple indexes of fit. We reviewed LISREL fit statistics including the chi-square test, the root-mean-square residual (RMSR) as well as the normed fit index (NFI; Bentler & Bonnet, 1980), the goodness-of-fit index (GFI; Jöreskog & Sörbom, 1986), and the comparative fit index (CFI; Bentler, 1990). The results supported the six-factor model. All loadings were significant at $p < .0001$. The chi-square was significant ($\chi^2 = 286.72$, df = 77, $p < .0001$) and inspection of the other fit indexes (RMSR = .07, GFI = .91, CFI = .87, NFI = .84) showed that they were all within the recommended ranges (Anderson & Gerbing, 1988) and comparable with Blais's validation of the questionnaire (Blais et al., 1993). Hence, we judged the six-dimension model to be acceptable given the supportive indexes. We also compared this model respectively to a two-factor and to a single-factor model to determine if the motivational items were better represented as tapping a two or a single underlying construct. The fit statistics for the two-factor model ($\chi^2 = 507.44$, df = 89, $p < .001$, RMSR = .09, GFI = .84, CFI = .75, NFI = .71) and for the single-factor model ($\chi^2 = 559.28$, df = 90, $p < .001$, RMSR = .09, GFI = .82, CFI = .72, NFI = .68) indicated a poor fit, thus corroborating a significantly better fit for the six-factor model (tested with chi-square difference test, χ^2 respectively = 220.72 and 272.56, $p < .0001$) compared to the two- and the single-factor model. Having confirmed the model, we can now test our hypotheses.

The Table 2 summarizes, for the quantitative part, all correlations between the salary dimensions studied and the motivational sub-types:

The first hypothesis concerned the relationship between base salary and intrinsic motivation. According to the assumptions of CET, it was hypothesized that the amount of the base salary is negatively related to the level of intrinsic motivation. However there was no significant correlation among them ($r = .02$). Base salary appears to have no diminishing effect on total intrinsic motivation. Furthermore, the results supported neither the assumptions of CET (that high levels of base salary are related to lower levels of intrinsic motivation) nor those of behaviorist theory (that high levels of base salary are related to higher levels of intrinsic motivation).

Our second hypothesis was that "Amount of Bonus" is positively related to intrinsic motivation. The results do not indicate any significant correlations (respectively $r = -.01$ and $r = -.05$). As with the first hypothesis, the results

Table 2: Intercorrelations between Salary Characteristics, Motivational Types and Sub-Types

N = 386 Quantitative Part	Amount of Base Salary	Amount of Bonus
Creativity	0.05	0.02
Variety	–0.06	–0.11*
Learning	–0.03	–0.03
Responsibilities	0.09	0.05
Challenging Tasks	0.14**	0.14**
Contacts with Coll.	–0.15**	–0.16**
Total Intrinsic	0.02	–0.01
Achievement	0.06	0.02
Life Goals	0.04	0.09
Contacts with Sup.	–0.11*	–0.13**
Power	0.17***	0.10*
Gratitude	–0.16**	–0.09
Usefulness	–0.14**	0.05
Material Rewards	0.23***	–0.01
Shareholding	0.14*	0.04
Job Security	–0.07	–0.14**
Total Extrinsic	0.04	–0.01
Total Motivation	0.04	–0.01

* $p < .05$; ** $p < .01$; *** $p < .001$

do not support either CET or behaviorist assumptions about the effects of rewards characteristics on intrinsic motivation.

In summary, there are no positive or negative effects related to the two salary characteristics over the total intrinsic motivation, as correlations are not significant (respectively, $r = .02$, and $-.01$).

The third hypothesis predicts that variations in intrinsic motivation related to salary characteristics are compensated by opposite effects on extrinsic motivation. As in the previous situation, Base Salary and Bonus do not correlate significantly with overall extrinsic motivation (respectively, $r = .04$, and $-.01$) and with "Total Motivation" (respectively, $r = .04$, and $-.01$). Our third hypothesis is thus not supported.

The examination of our first and second hypothesis showed that our findings do not agree with the current research on the overjustification effect regarding material rewards. They do not support the assumptions of CET or those of its behaviorist counterpart. Intrinsic motivation clearly does not vary concomitantly with pay characteristics, which leads us to assume that no over- or underjustification effect occurs in an organizational setting. As with our third hypothesis, we did not find any equilibrium mechanism between intrinsic and extrinsic overall motivation.

This might lead one to conclude that pay has no effect on intrinsic motivation. However, upon further examination, we will notice that while pay has neutral effects on total intrinsic and extrinsic motivation, this is not the case within the intrinsic and extrinsic sub-types.

Intrinsic sub-types

We find two significant correlations with an almost perfect symmetry between their positive and negative coefficients (see Table 2). The correlation between the "Amount of Salary" and "Challenging Tasks" ($r = .14$) is counterbalanced by the correlation with "Contacts with Colleagues" ($r = -.15$). For "Amount of Bonus", we find the same pattern: "Variety" and "Contacts with Colleagues" are significantly negatively correlated ($r = -.11$ and $-.16$), while "Challenging Tasks" is positively correlated. This suggests again the presence of an equilibrium effect.

The statistical significance of these differences between correlations coefficients was tested with the Fischer z-transformations and related q-values (Cohen, 1988; Cohen & Cohen, 1983).

All the differences except one (between Power and Variety for the Bonus variable) have been found to be significant at $p < .05$ and higher. Obviously, the pay attributes are not related to intrinsic motivation unilaterally. Pay level seems thus to be related to the intrinsic sub-types in a non-monotonic way. We have consequently found some initial evidence to support the existence of equilibrium mechanisms that neutralize unilateral effects of the amount of base salary on overall intrinsic motivation. This prompts us to ask: "is this also the case with extrinsic motivation?"

Table 3: Q Values for opposite significantly correlated Sub-Types for Base Salary and Bonus

N=386	Challenge		Power		Rewards		Sharehol.	
Quantitative Part	Base	Bonus	Base	Bonus	Base	Bonus	Base	Bonus
Variety		0.26*		0.21				
Contact Coll	0.29**	0.30**	0.32**	0.26**	0.38***		0.29**	
Contact Sup	0.25*	0.28*	0.28*	0.23*	0.34**		0.25*	
Gratitude	0.31**		0.33**		0.39***		0.30**	
Usefulness	0.28*		0.31**		0.37**		0.28*	
Job Security		0.28*		0.24*				

Tests for differences between Product Moment Correlations made with Power of Normal Curve Tests via Fisher z transformation at $a_1 = .05$ (Cohen, 1988): * $p < .05$; ** $p < .01$; *** $p < .001$

Extrinsic sub-types

As in the preceding context, we detect equilibrium mechanisms among extrinsic sub-types. The strongest compensations occur in the co-variations with "Amount of Salary". Three relationships are positively significant and three are negatively significant (r = .17 for "Power", r = .23 for "Material Rewards", r = .14 for "Shareholding", r = –.11 for "Contact with Superiors", r = –.16 for "Gratitude", and r = –.14 for "Usefulness", see Table 3 for the statistical significance of the differences). Within the intrinsic sub-types, we discovered only two significant correlations that neutralized each other. However, within the extrinsic sub-types, there are 6 correlations out of the 9 sub-types that compensate to keep the "Total Extrinsic" significantly uncorrelated with Base Salary. The amplitude of the homeostatic mechanisms seems thus even higher within extrinsic than within intrinsic motivation. The same pattern occurs with "Amount of Bonus", although at a lower intensity, since "Contact with Superiors", "Power" and "Job Security" are counterbalancing each other with significant correlations (respectively at r = –.13, .10, and –.14). Once again, these opposite correlations leveled off the overall extrinsic motivation, supporting the existence of equilibrium mechanisms in the extrinsic motivational type. It is also remarkable that for the most significant pay characteristic ("Amount of Base Salary"), 8 of 15 sub-types correlate significantly, without affecting either the intrinsic/extrinsic types, or the "Total Motivation".

Can we find the same pattern in the qualitative data? To find out, we proceeded to a content analysis of the 1002 remarks collected in the questionnaire. For each subject and sub-type of our model, we coded "1" if the sub-type has been mentioned as one of the three most important sources of motivation and "0" if not[2]. In order to diversify our statistical analyses, we used the k-mean clustering method to build four clusters for each compensation variable (Base Salary: $F(3,382) = 939.22$, $p < .0001$; Bonus: $F(3,382) = 867.99$, $p < .0001$). To test for the main effect of the pay variables on the motivational sub-types, we computed two ANOVA (Base Salary and Bonus). These are presented in Table 4 (significant sub-types only are exhibited).

The motivational sub-types "Variety", "Contact Coll." and "Contact Sup." show a clear pattern. For Base Salary and Bonus, the mean percentage of occurrence is decreasing as we move to higher clusters; for instance, for Base Salary, 60% (0.60) of the subjects in the lowest paid cluster no. 1 have mentioned "Variety" as one of their three

Table 4: ANOVA F-Values and Mean percentage of occurrence for each significant motivational Sub-Type and Cluster

Qualit. Part	Variety n=174		Challenge n=27		Contact Coll. n=138		Contact Sup. n=65		Power n=18		Rewards n=45	
	Base	Bonus	Base	Bonus	Base	Bonus	Base	Bonus	Base	Bonus	Base	Bonus
N=386 F (3,382)	9.75***	7.55***	14.48***	6.71***	20.82***	15.23***	8.78***	3.99**	14.54***	8.19***	34.83***	15.06***
Cluster 1 n = 117;134	0.60	0.57	0.07	0.07	0.62	0.56	0.31	0.24	0.05	0.04	0.01	0.08
Cluster 2 n = 136;121	0.49	0.47	0.01	0.03	0.26	0.29	0.13	0.18	0.01	0.00	0.06	0.06
Cluster 3 n = 80;86	0.26	0.35	0.05	0.05	0.26	0.27	0.10	0.09	0.00	0.05	0.14	0.10
Cluster 4 n = 53;45	0.30	0.22	0.26	0.22	0.15	0.11	0.06	0.07	0.21	0.18	0.47	0.40

* p < .05; ** p < .01; *** p < .001
– Clusters Base Salary: (1) < 75 114 (2) < 105 251 (3) < 150 339 (4) > = 150 339
– Clusters Bonus: (1) < 1000 (2) < 17 000 (3) < 47 000 (4) > = 47 000

2 Given the qualitative nature of the data in this section, we are not measuring motivational level, but only number of occurrences.

most important motivations. This proportion is significantly decreasing, respectively to .49, .26 and .30, for clusters 2, 3 and 4. With smaller F values however, we find the same reduction of mean percentage for Bonus. Consequently, we can assert that motivations for variety, contacts with colleagues and superiors are significantly more important for the lowest paid people than for the highest paid.

On the other hand, we find that pay variables have the opposite effect on the sub-types "Challenge", "Power" and "Rewards". The mean percentage of occurrence is significantly increasing in the best paid clusters. For example, the motivation for power is almost never cited in the clusters 1, 2 and 3, but becomes much more important for the best paid people as respectively 21% and 18% of the subjects in cluster 4 are citing "Power" as one of their three main motivations. Consequently, these three sub-types of motivations are much more important for the highest paid people than for the lowest paid.

Based on the analysis of qualitative data, we therefore find further support for the presence of homeostatic mechanisms between motivational sub-types. Using pay variables as a discriminating factor, we demonstrate that the sub-types "Variety", "Contact Coll." and "Contact Sup." seldom co-exist with "Challenge", "Power" and "Rewards" for the lowest paid individuals, and vice versa.

Given the strong evidence for the equilibrium mechanisms within the quantitative and qualitative parts, we searched for confirmation of the same pattern in a context not limited to the reward only. The question that arises is: "can we trace the presence of the same mechanisms beyond the correlations between pay characteristics and motivation sub-types?" Moreover, "do these mechanisms also take place within a general motivational level?"

To investigate this point, we examined the variances and their homogeneity between the types, sub-types and the overall motivation. By comparing these variances and their mean with those of "Total Intrinsic", "Total Extrinsic" and "Total Motivation", it is possible to determine whether the individual differences in the sub-types sum up, or are, instead, leveled off at a higher motivational level. In other words, if we consider the variance of the overall sample, we will measure how much variability is captured from categorizing into different motivational concepts. Table 5 summarizes this information:

The variance of the 15 sub-types ranged from 1.47 to 3.36, with an average of 2.34. We applied the Brown-Forsythe test for the homogeneity of variance since the traditional Levene test is not discriminating enough. We found that the variances of all the sub-types were significantly different than the variances of "Total Intrinsic", "Total Extrinsic" or "Total Motivation". Consequently, the variances of every sub-type are significantly different from each of the three grouping indicators.

Table 5: Variance and % of Captured Variability by Motivational Types and Sub-Types

N=386 Quantitative Part	Variance	%ge of Captured Variance
Creativity	2.62	93
Variety	1.81	64
Learning	1.86	66
Responsibilities	2.45	87
Challenging Tasks	2.37	84
Contacts with Colleagues	1.78	63
Achievement	2.35	83
Life Goals	3.05	108
Contacts w Superiors	1.87	66
Power	2.85	101
Gratitude	2.02	71
Usefulness	1.47	52
Material Rewards	2.66	94
Shareholding	2.61	92
Job Security	3.36	119
Mean of all Sub-Types	2.34	83
Total Intrinsic (TI)	1.00[1]	35
Total Extrinsic (TE)	0.82[2]	29
Total Motivation (TM)	0.69[3]	24
Overall Variance	2.83	100

[1] TI (1.00) is non-homogeneous with Usefulness (1.47) at $p < .05$. All others are different at $p < .001$

[2] TE non-homogenous with Usefulness at $p < .001$. All others are at $p < .00001$

[3] All sub-types variances are non-homogeneous at $p < .00001$

N.B.: p-levels result from Brown-Forsythe test for the homogeneity of the variance

In terms of captured variability, the categorization of our data into motivational sub-types yields, on average, more than 80% of the overall variability (83% of 2.83, which is the "Overall Variance" of the sample). On the other hand, grouping our data into indicators like "Total Intrinsic", "Total Extrinsic" and "Total Motivation" renders respectively 35, 29 and 24% of the overall variability. What can we conclude from these figures? Using the same reasoning as before, if the dispersion in the sub-types no longer appears in "Total Intrinsic", "Total Extrinsic", or "Total Motivation", we can assert the presence of equilibrium mechanisms that neutralize the differences. In other words, the subjects are highly differentiated in terms of sub-types, but these differences counterbalance each other in terms of intrinsic, extrinsic and overall motivation. We therefore lose up to 70% of the variance if we compare the overall motivation to the average variance of all Sub-Types (0.69 vs. 2.34). Another way to interpret this finding is to say that the subjects are highly heterogeneous in terms of motivational sub-types, but significantly more homogeneous in terms of total intrinsic/extrinsic and global motivation.

According to our results, equilibrium mechanisms are

not limited to rewards contexts, but also occur in general among all sub-types when categorized into intrinsic/extrinsic types and overall motivation. The homeostatic mechanisms found in the intrinsic/extrinsic types are thus confirmed at an upper level of analysis and seem to underlie the motivational phenomenon in its global dimension.

Discussion and Conclusion

As demonstrated, the major reasons for the lack of variations in intrinsic, extrinsic and overall motivation are the equilibrium mechanisms that neutralize the internal variations of the sub-types in a higher motivational level[3]. The existence of equilibrium patterns in both intrinsic and extrinsic types, and in the overall motivation, forces us to alter some of our traditional representations of motivation. Motivation is generally comprehended as a "balloon" that can be inflated and deflated, notably under environmental and organizational control, and particularly with material rewards like base pay and bonuses. Our results indicate that a strong internal dynamic has been overlooked in most of the studies on the subject. We therefore encourage researchers to revisit motivation and consider it as complex set of elements functioning in ways that keep an internal balance and coherence. Acting on the motivational system with pay variables is likely to imply positive effects on several motivational sub-types, but these "gains" in motivation are likely to initiate counterbalancing negative feedback effects which keep the system in balance by reducing other motivational sub-types[4]. As our study demonstrates, a high level of salary is related to higher levels of motivation for "Challenging Task", "Power", "Material Rewards" and "Shareholding" but at the same time, indicates detrimental effects on competing sub-types like "Variety", "Contacts with Colleagues", "Contacts with Superiors", "Usefulness", and "Gratitude". As subsequently confirmed, the detrimental effects do not fall within intrinsic sub-types of motivation only, and are not limited to material rewards exclusively, but encompass all motivational phenomenon. In summary, it appears that the motivational system possesses a strong internal dynamic that makes it difficult to modify either its level or its composite.

A question provoked by the research results is: "how is it that the lowest paid people do not have the same motivational structure as the highest paid individuals?" We believe it is probable that pragmatic motivational coping mechanisms underlie this difference. It was evident from the qualitative portion of the questionnaire, and from the 400 interviews, that the lowest paid employees are not in a personal and organizational position to be motivated by challenging tasks, material rewards, or power. Instead, they must compensate for this by finding other sources of motivation in order to keep their systems in balance (variety of tasks, contacts with colleagues and superiors), and the opposite is true for the highest paid people. In other words, and given the methodology and results of the quantitative part[5], it is clear that all motivational sub-types cannot be activated at the same time. Given that intrinsic, extrinsic and overall motivation move toward an equilibrium without too much variation, motivation can be conceptualized as a source of energy. Its availability could be finite (and thus impossible to pump above a particular level) but also essential for individual actions (and thus impossible to allow it to drop below a certain level). Thinking of motivation in these terms is equivalent to declaring that an individual cannot be overmotivated because motivational energy is limited. At the same time, it means an individual cannot be demotivated when activities are unavoidable, as when employees cannot switch jobs because of economic or personal constraints[6].

The psychological dimension of this phenomenon can be clarified by reference to cognitive dissonance (Festinger, 1957) and coping theories (Lazarus & Folkman, 1984). As we can characterize behavior in the organizational setting as occurring in a "freely given compliance" state (Joule, 1986), situations occur where subjects have to produce behaviors that are incompatible with their motivational structure. The dissonance state that arises in this situation can be reduced via psychological coping processes of cognitive rationalization ("it is not stupid to

3 The notion of homeostasis is not new. Psychoanalytic (Freudian) and drive (Hullian) conceptions of motivation are grounded in the principle that any deviation from equilibrium produces a force to return to a state of internal balance (Weiner, 1992). Originally applied to viscerogenic and bodily needs, we are extending the concept to the psychogenic domain.

4 Here are some typical comments collected in the face-to-face interviews that illustrate the homeostatic effects: "With this promotion I have lost some good friends (decrease in sub-type 'Contact Colleagues'), but on the other hand, I got a good salary increase (increase in sub-type 'Rewards')", or "This new job is less diversified (decrease in 'Variety'), but now I can influence the course of things (increase in 'Power')".

5 As the scores of the quantitative part were not constrained, the subjects were free to allocate the highest score to all motivational sub-types. As stated in the analysis, this scenario did not occur.

6 We collected numerous remarks such as: "we still need some sort of motivation" or "I can't keep doing my job if can't find a reason for doing it".

do what I have done")(Beauvois & Joule, 1996, 151; Beauvois, Joule & Brunetti, 1993; Joule, 1986) and internalization ("if I have done it, then it is because there was something in me which drove me to do it ") (Beauvois & Joule, 1996, 151; Jones & Gerard, 1967; Lepper, 1983). We can thus conceptualize the motivational equilibrium mechanisms as an emotional coping strategy (Folkman et al., 1986) aimed at realigning motivational cognitions after the production of the behavior in a way that makes them as predictive as possible of this behavior (Beauvois, Joule & Brunetti, 1993). Formulated by Beauvois and Joule, these cognitive mechanisms can be seen as "a process aimed at the rationalization of a behavior that was produced to satisfy a request made by the experimenter [by the organization] but that from the outset was not justified by the subject's convictions, motivations or beliefs."[7] (Beauvois & Joule, 1996, 24).

These assertions cannot be formally demonstrated by our research, because it measures a single point in time. Future research should address the subject with a dynamic approach by measuring longitudinally the alterations that take place in the motivational system under fluctuations in the organizational environment, such as salary changes, bonuses, or promotions.

This conception of motivation forces us to revisit its definition. Most of the developments in motivational theory generally, and in CET in particular, conceptualize motivation as an ex-ante psychological construction that coerces or forces action (Kanfer 1991, 1994; Vallerand & Thill, 1993; Vroom, 1964). A motivational determination of action is then presumed to occur before the behavior occurs. However, based on this research and in the light of rationalization and internalization processes, this is a limited view, especially in organizations where individuals are exposed to strong constraints on their behaviors, and consequently on the motivations underlying them. We suggest that researchers should also consider motivation as a post-hoc reconstruction that is subject to cognitive readjustment, rationalization, internalization and equilibrium adjustments. Once again, what is necessary are longitudinal studies on motivation that can capture its dynamic nature and, notably, the psychological mechanisms that underlie the cognitive readjustment process over time.

These results leave numerous aspects of motivation unaccounted for and present several directions for future research. Questions should be directed toward the processes that are steadying and destabilizing the motivational structure. What are the impacts of individual and organizational characteristics on these processes? One approach could be metaphorically to adopt synergetic theory (Haken 1984) to identify organizational and individual parameters of "order" and "control" that can explain changes in motivational states and to explore how this disequilibrium occurs.

As motivations justify actions, and as the coercive aspects of organizational influence are related to a process of internalizing causality, it would also appear relevant to study these mechanisms in the light of attributional phenomena (Weiner, 1974, 1985, 1992), and in particular the dimensions of "locus of control" and "controllability" over the environment. It would be helpful to understand how employees internalize into their own motivation systems the motivational values advanced by the organization, and how permeable are the individual motivational values to pressure from the environment. Aspects related to individual tolerance for motivational concessions and adaptations are also promising. Specifically, it would be interesting to know to what point an individual is willing to adapt the motivational structure to the environment's demands, and how he reacts when organizations put pressure on the motivational system. The existence of a dissonance threshold that could trigger reactions like avoidance, withdrawal, absenteeism or even turnover would be of the greatest interest for both researchers and practitioners.

In conclusion, motivation is a complex and closely veiled psychological phenomenon that occurs within the individual and that is interrelated with the organizational environment. Given its complex character, future research should seek to understand the human motivational system as one in which the individual actively integrates internal and external motivational pressures into the system to restore a stasis. A more comprehensive understanding of this phenomenon will require dynamic research designs aimed, not only at investigating how a system can be described at a single point in time, but at grasping how a system changes.

7 Here is a typical remark collected during the interviews that illustrates this point: "I had to begin a new project and I didn't know exactly what to expect. What I knew from the job and from the people didn't really motivate me. Now, when I think about it, it was not that bad. I learned a couple of good things and the money was OK".

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