New Fields of Career

How to Behave Successfully in the Field of Chronic Flexibility
A Social Simulation Study Based on Co-operating Normative Agents

Guido Strunk, Anett Hermann and Michael Schiffinger

Introduction

Working life becomes more and more complex. This statement can be found in most scientific approaches to careers since the early 1990's. But there is only little theory development that takes these current changes regarding typical forms, actors and contexts of careers into account. Conceptual frameworks that allow for multi-level analysis and conceptually go beyond the organization as explicit or implicit arena for professional careers should prove particularly useful for a theoretical advancement of this domain. Based on Bourdieu's habitus and field concept, Mayrhofer et al. (2000) suggested four different fields of careers:

- **Company World (CW)** is the field of the traditional organizational career. It refers to a (mostly hierarchically structured) pattern of jobs within one or few organization(s) in which there are few points of entry, other than at the bottom.

- **Free-Floating Professionalism (FFP)** can be defined as the field of specialists. Individuals have tightly coupled relations with one customer for a limited time.

- **Self-Employment (SE)** is the field of career with individuals working outside organizations. Typically, these are either self-employed professionals or entrepreneurs.

- **Chronic Flexibility (CF)** may appear quite similar to Free-Floating Professionalism, since careers are also characterized by frequent job changes. The fundamental difference lies in the disappearance of the boundaries of a domain of expertise. This means that changing from one job to another may imply not only a change from one organization to another, but also from one industry to another, from being employed to self-employment, and so on.

A lot of work on behavior that is said to lead to career success has been published – but almost solely focused on organizational careers (the "Company World" career field). In contrast, according to Bourdieu's habitus and field concept, fields can be seen as a playground with actors realizing strategies by playing according to the rules of the game, as defined by a specific set of capital which has to be transformed into specific behavior patterns most valuable for holding and gaining power within the field (e.g. Bourdieu 1986). So, different fields possess different rules of the game.

In order to find out which varieties of behavior may lead to career success in the field of Chronic Flexibility, a social simulation framework is used where two groups of actors play against each other.

Our approach uses a social simulation framework based on co-operating normative agents, established by Conte and Castelfranchi (1995, Castelfranchi, Conte and Paolucci 1998), who use their model to investigate the influence of social norms on aggression. This simulation model seems to be very similar to the Chronic Flexibility Career Field, where actors also take jobs only for a limited time without a long-term career and advancement perspective within an organization. Both job-hopping and also periods of unemployment can be seen as a main characteristic of the Chronic Flexibility Career Field and of the social simulation framework developed by Conte and Castelfranchi.

The rules used by the two groups of agents are based on different behavior patterns frequently mentioned in literature about inequality between men and women in the more highly qualified job market. Several authors dealing with gender inequality have pointed out that not only discrimination leads to inequality but also different behavior-patterns of men and women. This different behavior hypothesis is fiercely debated within gender research. It is still unknown if there are really gender-specific differences and how to explain the development of such differences if they are supposed to be found.

Additionally, most investigations of that problem are using qualitative data from field-studies. Thus it is also not clear if supposed differences between men and women really lead to inequality in career development and in getting jobs.

In this paper, the role of some different behavioral norms presumed for men and women and their effect on inequality and success within an "articificial life setting" that can be compared to the Chronic Flexibility Career Field will be explored.

In the following section we will first describe the simulation model of Conte and Castelfranchi and secondly the necessary changes of the model to adapt it for our investigation purposes. Next we will be testing the correct implementation of the model by reinvestigating some main findings of Conte and Castelfranchi. This strategy follows a paper of Saam and Harrer (1999) who have also used the Conte and Castelfranchi model.

One of the most important theories dealing with career success in companies is the tournament theory, developed by Rosenbaum (1979). Our findings will show that in a Chronic Flexibility career field some suggestions for "successful" behavior derived from the tournament theory seem to be misleading.
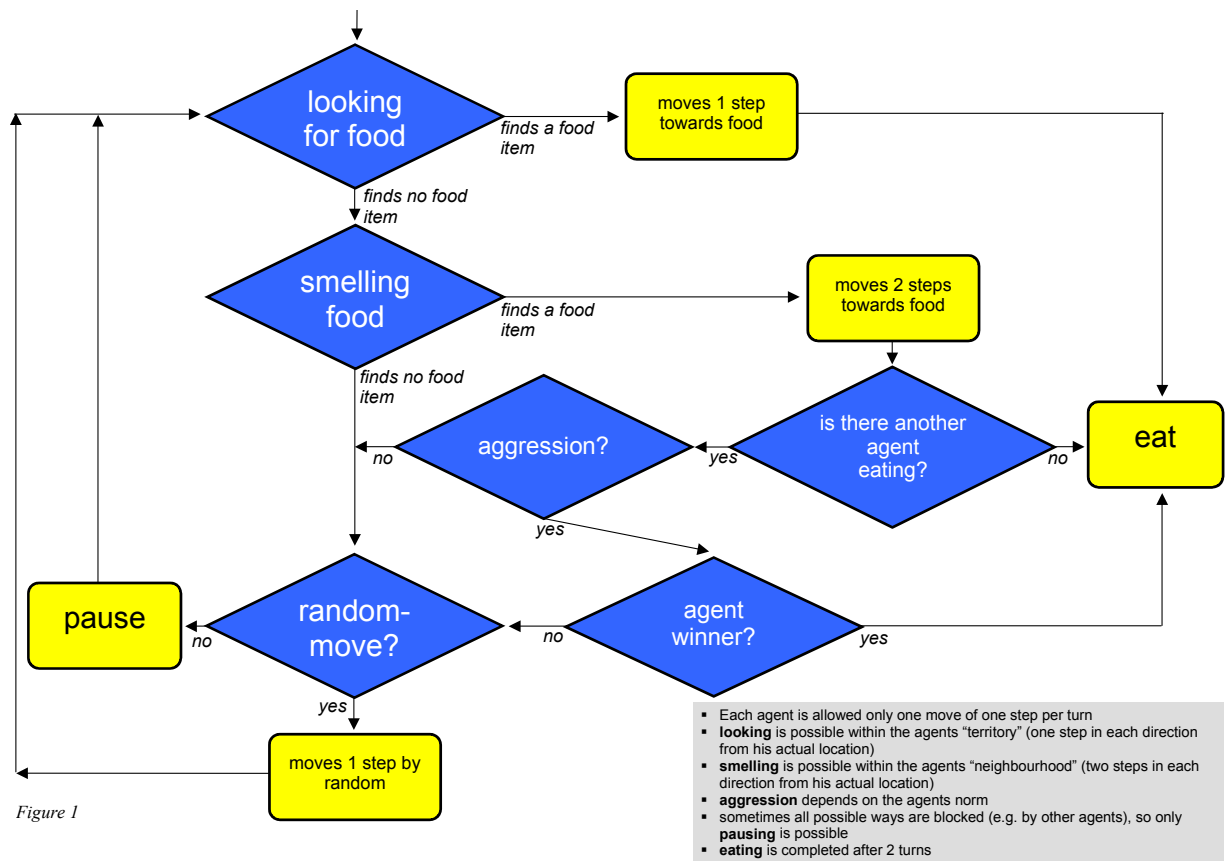

The Experimental Design

The artificial social model, implemented in C++, defines agents moving in a world of a 10 x 10 grid with randomly scattered food. The agents' greatest desire is to eat as much food as possible. But there are 50 agents in total and only 25 food items. Nevertheless there is a chance of getting food for all agents, because eaten food items are restored at a randomly chosen location immediately after being eaten.

Eating food increases the agents' strength, but every action is followed by a loss of strength. Successful agents will be able to eat more food than the others, therefore having greater strength at the end. An experiment consists of a set of 100 matches, each including 2000 turns. At the beginning of each term, every agent selects an action from six available routines:

1. MOVE-TO-FOOD-SEEN,
2. EAT,
3. MOVE-TO-FOOD-SMELLED,
4. AGGRESS,
5. MOVE-RANDOM,
6. PAUSE.

As can be taken from Figure 1, aggression is only a possible option after a MOVE-TO-FOOD-SMELLED. If after such a move an agent encounters another agent eating the food, the approaching agent will consider aggressing the eating agent, depending on his norm. The norm determines under which circumstances an attack will be executed (e.g. strategic norm: agents will only attack those eaters whose strength isn't higher than their own). The outcome of an attack is determined by the agents' strength. The stronger agent is always the winner. When the competitors are equally strong, the defender is the winner. See Table 1 for available norms and Table 2 for costs/benefits of all possible actions.

Figure 1

Within the figure, the following notes appear:

- Each agent is allowed only one move of one step per turn
- **looking** is possible within the agents "territory" (one step in each direction from his actual location)
- **smelling** is possible within the agents "neighbourhood" (two steps in each direction from his actual location)
- **aggression** depends on the agents norm
- sometimes all possible ways are blocked (e.g. by other agents), so only **pausing** is possible
- **eating** is completed after 2 turns

Norms

1.	Norm:	**blind aggression:** attack if possible
2.	Norm:	**strategic:** attack only if you are stronger than opponent
3.1	Norm:	**male networking:** do not attack members of your own group / blind aggression against others
3.2	Norm:	**male networking:** do not attack members of your own group / strategic aggression against others
4.	Norm:	no aggression for food under agents' strength level

Table 1

Cost/Benefits

Strength at start	40
Move	1
Aggress/Defend	4
Pause	1

Table 2

Differences Between the Conte – Castelfranchi – Model and the Present Study

Norm 1 and norm 2 were developed in the original work of Conte and Castelfranchi. Norms 3 and 4 have been designed for this study, according to literature on differences in behavior between men and women (see below).

In their original model Conte and Castelfranchi chose a fixed nutritive value of 20 points per food item (if an agent has finished eating, his strength increases by 20 points). This didn't seem appropriate for our field (career development). We therefore implemented three different types of food with low-, medium- and high-level nutritive values of 10, 30 and 72 points respectively.

In our artificial society there are 12 units of low-level, 8 units of medium-level and 5 units of high-level food items available – 25 in total, which is the same number as in the original model. Conte and Castelfranchi point out that it has to be supposed that all actions of the agents are simultaneous within one turn. But in fact computers do not work like this. In order to make sure that no agent gets a better chance, the starting agent and the ranking of the others are chosen by random before each turn.

Measurements

For each experiment (a set of 100 matches), the average strength and the standard deviation of strength were recorded separately for agents supposed to be men and women. The standard deviation is considered as a measure of inequality; the larger the standard deviation, the less equitable the distribution of strength.

Replication

Before we started our experiments using our changed framework, we re-simulated the original model to guarantee that we can reproduce the original results. According to Conte and Castelfranchi, "blind aggression" is less effective and leads to higher inequality than the "strategic" norm. Our findings indicate the same, but on a lower level. Both average strength and standard deviation of strength are lower than in the original simulation for both norms. Nevertheless our replication results reproduce the original results qualitatively.

Male and Female Behavior

Four norms have been designed for this study, according to literature on differences in behavior between men and women. Some aspects of typical male behavior have been found to be more effective for career development. As a basis for defining norms 3 and 4, we drew on theoretical work about "Männerbünde" (the original German word "Männerbünde" (Rastetter, 1998) refers to a special form of male networks) and the tournament theory of Rosenbaum (1979, 1984).

In our framework it is not possible to take all aspects of male networks and tournament theory into account, but norm 3 refers to the basic logic of these "male circles", which are known to be highly cohesive networks between men established in secondary socialization (e.g. in student clubs).

The concept of "Männerbünde" also describes the situation relating to barriers encountered by women on their career path in management. The number of high positions in top-management is very small and it is difficult for women to break the "glass ceiling" and attain a position in this area.

The "Männerbund" as a basic element in management keeps up the male predominance through the exclusion of women. Women don't have the same access to building networks and have no (or less) experience in developing informal networks or establishing contact with peers. For our simulation, the principles of male networks ruled out aggression of "male" agents against other "males" (norm 3).

Taking into account that the 3rd norm only refers to agents of the same group (no aggression against members of the own group) a norm will be needed for aggression against non-group members. Therefore norm 3 is combined one time with norm 1 and another time with norm 2.

Norm 4 follows a finding of the tournament theory of Rosenbaum (one of the main theories of career development). The tournament theory is based on the assumptions of Social Darwinism. The basic dynamics of Rosenbaum's theory rest upon the human capital model (Becker & Gary

1964). The main statement of the tournament theory is that people invest in their own human capital and consequently in their own future careers. Rosenbaum suggested that it has a very positive influence on later career success to start with a job which is not below one's level of skill. This refers to our 4th norm: agents will only attack to get food at the level of their strength. In order to implement the comparison of food level and strength level, all male agents are ranked by strength and divided into three numerically equal classes (high, medium and low) every time an attack is possible. Therefore, before every possibility to attack, male agents know their own relative strength level and can compare it to the nutritive value of the food item.

Norm 1 and norm 2 are supposed to be neutral with regard to gender-specific behavior. In order to test each norm against each other we developed 10 experiments, which can be taken from Table 3.

	norm A	norm B	Hypothesis	significance
Exp. 1.	1	2	*B is stronger*	*
Exp. 2.	1	3.1	*B is stronger*	*
Exp. 3.	1	3.2	*B is stronger*	*
Exp. 4.	2	3.1	*B is stronger*	*
Exp. 5.	2	3.2	*B is stronger*	*
Exp. 6.	3.1	3.2	*B is stronger*	*
Exp. 7.	1	4	*B is stronger*	*
Exp. 8.	2	4	*B is stronger*	
Exp. 9.	3.1	4	?	
Exp. 10.	3.2	4	?	

$* p < 0,01$

Table 3

Findings

As can be seen from Figure 2, norm 2 is stronger than norm 1. This result is still known from the original model of Conte and Castelfranchi. In comparison to our hypothesis, only norm 3 always leads to a higher (in some cases to a much higher) strength of the depending agents.

Norm 4 is just better than wild aggression (norm 1) and not different from strategic behavior (norm 2). According to Figure 3, norm 4 always leads to higher standard deviations, which means that the distribution within this group is very polarized. In order to get a better insight into the data, Figure 4 was designed taking both into account, the mean value and the standard deviation of strength (mean divided by standard deviation). As can be taken from this figure, norm 4 leads to very low values and proved itself downright inferior compared to "norm 3 combined with norm 2".

Conclusion

Our investigation on different behaviors of men and women using an artificial social model to simulate a Chronic Flexibility Field of Career indicates that there are great differences in outcome depending on different behavioral norms. The hypothesis that male networking leads to higher strength than the other norms is supported by our findings, but we didn't expect our results to be that clear-cut.
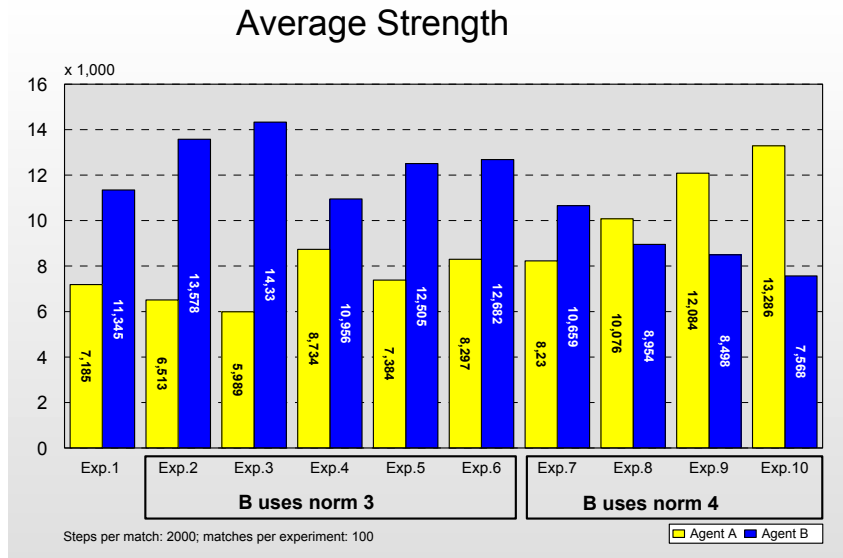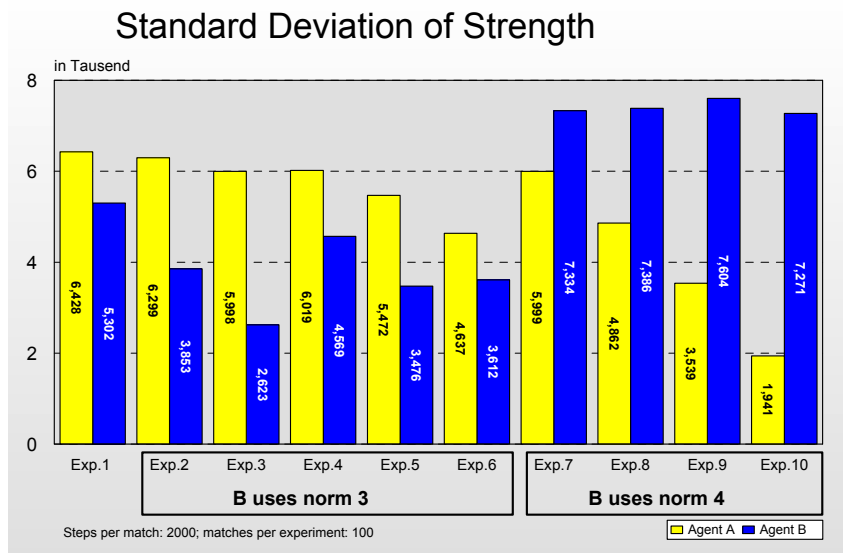
Average Strength

Figure 2

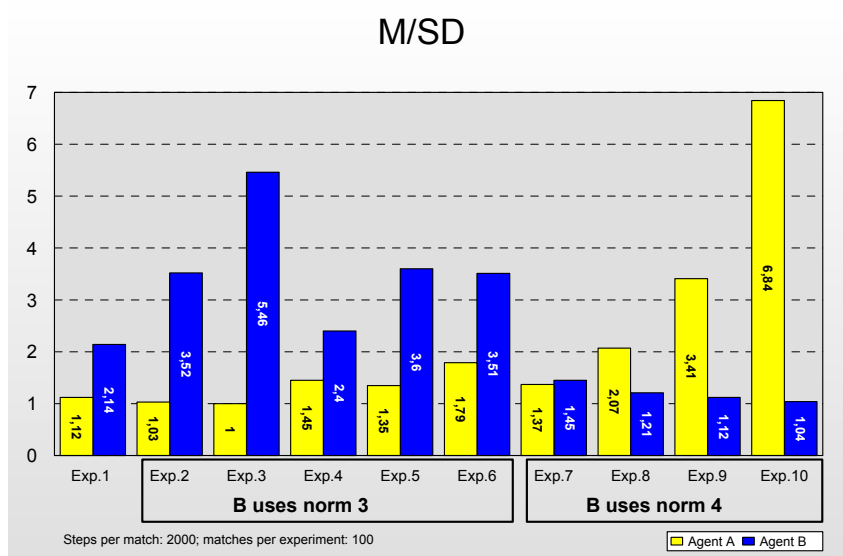## Standard Deviation of Strength

Figure 3

M/SD

Figure 4

On the other hand, sticking to norm 4 (no attack if nutritive value of food is below one's own strength level) didn't turn out to be a promising way to getting strong at all.

This result yields some very interesting and intriguing implications, if two assumptions are justified. The first one: careers will less and less resemble the traditional "Company World" career path but rather be "patchwork" careers with frequent changes of employment status, field of professional activity and "customers". The second one: the simulated social field is similar to such a state of "Chronic Flexibility" (see above). Support for the first assumption can be found in most of the recent career literature (e.g. Arnold 1997, Arthur and Rousseau 1996, Arthur, Inkson and Pringle 1999, Bridges 1994, Hall 1996, Peiperl and Baruch 1997). The second assumption can be justified based on the argument that it is in particular the absence of long-term rules and perspectives, the perpetual "start from square zero" instead of seniority-based advantages that mark both the simulation parameters and the "Chronic Flexibility" career field.

Under these assumptions, our findings imply that the rules for successful behavior as far as career advancement is concerned have radically changed. Contrary to what Rosenbaum suggests, it does not matter who you are and what reputation you have. If one can find a job, he or she is well advised to take it, no matter whether it is a job under his or her level of skill.

So the "advice for success" that can be derived from this simulation is: on the one hand, get as much as you can, leave no job or battle out – there is no such thing as a job *infra dig*; but at the same time be strategic, don't rely on blind aggression and use your networks!

It is clear that the computer simulation model can not simulate real life in all its complexity but it might certainly give fresh insight into recent developments concerning occupational life.

In order to take yet a closer look at these developments, the Vienna Career Panel Project (ViCaPP) has started in the year 2000 to build up a panel study following the careers of business graduates for the next twenty years, beginning from their first steps in working life after graduation (Mayrhofer et al. 2000). We will thus hopefully be able to see and analyze in "real life", what tomorrow might bring, career-wise.

References

Arnold, J. (1997): Managing Careers into the 21st Century. London: Chapman

Arthur, M., Rousseau, D. (1996): "Introduction: the Boundaryless Career as a new employment principle" in: Arthur, M., Rousseau, D. (Eds.): The Boundaryless Career. New York, NY [u.a.]: Oxford University Press, pp. 3-20

Arthur, M., Inkson, K., Pringle, J. (1999): The New Careers. Individual Action and Economic Change. London: Sage

Bourdieu, P. (1986) The Forms of Capital. In: Richardson, J.G. (Ed.) Handbook of Theory and Research for the Sociology of Education. New York, pp. 241-258.

Bridges, W. (1994): JobShift. How to Prosper in a Workplace Without Jobs. Perseus Books: Reading, Mass.

Castelfranchi, C., Conte, R. & Paolucci, M. (1998) Normativ Reputation and the Costs of Compliance, in: Journal of Artificial Societies and Social Simulation, 1(3)

Conte, R. & Castelfranchi, C. (1995) Understanding the Functions of Norms in Social Groups through Simulation, in: Gilbert, N. & Conte, R. (Eds.) Artificial Societies. The Computer Simulation of Social Life. London: UCL Press. pp. 252-267.

Hall, Douglas T. (1996): The Career Is Dead – Long Live the Career. San Francisco, Cal.: Jossey-Bass

Mayrhofer, W., Steyrer, J., Meyer, M., Erten, C., Hermann, A., Iellatchitch, A., Mattl, C. & Strunk, G. (2000): Toward a Habitus Based Concept of Managerial Careers. Toronto, Canada

Peiperl, M.; Baruch, Y. (1997): "Back to square zero: the post-corporate career" in: Organizational Dynamics, Vol. 25, No. 4 (Spring 1997), pp. 7-22

Rastetter, D. (1998): Männerbund Management. Ist Gleichstellung von Frauen und Männern trotz wirksamer archaischer Gegenkräfte möglich, in: Zeitschrift für Personalforschung, Vol. 12, No. 2, pp. 167 – 186.

Rosenbaum, J.E. (1979): Tournament mobility: career patterns in a corporation, in: Administrative Science Quarterly, 24, pp. 220-241.

Rosenbaum, J.E. (1984): Career Mobility in a Corporate Hierarchy, New York, Academic.

Saam, N.J. & Harrer, A. (1999) Simulating Norms, Social Inequality, and Functional Change in Artificial Societies, in: Journal of Artificial Societies and Social Simulation, 2(1)