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Abstract

Despite serious criticism, the boundaryless view of careers still heavily influences research. This paper aims to do more than just challenge the claim that careers are becoming more boundaryless: our goal is to make clear that careers need to be thought of in alternative terms. To this end, we build on an analysis of academic careers to explain why regarding careers as either bounded or boundaryless is too simple and why more attention should be paid to the scripts that influence career choices. We draw from an empirical study carried out in two French universities which shows that promotion scripts operate under three conditions - credibility, legibility, and legitimacy of promotion models. We conclude that scripts are potentially very useful in understanding a wide range of careers.

Key words: career, boundaryless career, script, academics, interaction.

Academic Careers: The limits of the “boundaryless approach” and the power of promotion scripts

Introduction

The “boundaryless career” approach (Arthur, 1994; Arthur and Rousseau, 1996) - which suggests that individuals have increasingly more freedom to create careers that are no longer bounded by any predetermined pattern - has been criticized for its lack of empirical data and attention to context (Nicholson, 1996; Jacoby, 1999; Dany, 2003; Pringle and Mallon, 2003; Duberley et al., 2006; O’Mahony and Bechky, 2006); but it still marks scholarly debates and is utilized by authors trying to characterize new careers and the skills they require (Sullivan and Baruch, 2009), as well as by those calling for a more bounded view of careers (Gunz et al., 2000; Gunz et al., 2007; Ituma and Simpson, 2009; Rodrigues and Guest, 2010). In this article, we consider that the contrast between the bounded and boundaryless careers is simplistic in its viewpoint regarding structures (i.e., environmental constraints) and individual agency (i.e., individual choices) and overlooks the constant meshing of the two in shaping actual careers (Evetts, 1992; Gunz, 1989). With this in mind, we call for a more nuanced view of career, one that acknowledges individual agency without jumping to the false conclusion that people’s current careers depend mainly on their individual choices. Searching for an alternative approach that accounts better for the simultaneous influences of both individual choices and environmental constraints on careers, we explore the relevance of the notion of “career scripts” (Barley, 1989; Duberley et al., 2006) in the contemporary, allegedly boundaryless environment.

More precisely, the study of academic careers - previously suggested as archetypical examples of boundaryless careers (Arthur and Rousseau, 1996; Baruch and Hall, 2004) - enables us to highlight the limits of the notion of boundarylessness to characterize careers. We then show that, although the idea of “weak environment” (Weick, 1996; Bell and Staw, 1989) - at the heart of the boundaryless careers approach - has diverted attention from career scripts, the notion of scripts is far from outdated. Our results indicate that, even when only weakly institutionalized (Tolbert and Zucker, 1996), scripts are still likely to play a critical role with regard to career-shaping, and that studying them can help us better understand the career orientations of individuals who might view promotion rules as both constraining (Kanter, 1989) and protective (Karpik, 1996).

Our research relies on empirical data about the careers of biologists and historians in two large French universities. The biology case is particularly interesting, as life-sciences are becoming the dominant model for French academic careers, while history is a more traditional discipline with different career pressures. We hope that studying careers in two dissimilar disciplines will make our findings more comprehensive and enable us to avoid the trap referred to in the literature as “excessive reification” (Evetts, 1992).

Our article is structured as follows: first, we offer an analysis of the literature devoted to academic careers, and we clarify how studying such careers can contribute to career theory in general by highlighting problems of the boundaryless career notion. Second, we define career and promotion scripts. Third, we outline the context of the study and explain the research design we used to study the power of promotion scripts in contemporary academic career environments. Finally, we present our main results and discuss how they challenge the boundaryless approach to careers, and we confirm that academic careers are still marked by

scripts that express environmental constraints along with individual agency.

What can be learned from academic careers?

Academic careers have been studied for years in order to gain insights regarding the conditions that contribute to scientific production; economists, in particular, have explored the relationship between tenure and productivity (Stephan and Levin, 1997). However, career scholars have paid little attention to academic careers as of yet (Kaulisch and Enders, 2005), although academia is going through dramatic changes that call into question how these careers are structured (Harley et al., 2004). In this paper we argue that academic careers are of much interest to career theory in general, which raises two challenges: are careers becoming more boundaryless? Is there such a thing as boundarylessness, per se?

Diversity in academic careers

In 1996, Arthur and Rousseau (1996) identify academic careers as boundaryless careers, because such careers do not depend on any single organization, with academics supposedly managing their careers by and for themselves, moving from one research project to another, and searching for the best opportunities offered by universities. Along the same line, Baruch and Hall suggest that academic careers illustrate “networking across organizational borders”, showing how individuals can decide on their contribution, “with professional reference serving for defining roles within teams rather than formal position” (2004: 249). They call for additional empirical studies of academic careers in different countries in order to further enhance our understanding of the notion of boundaryless careers. De Janaz and Sullivan (2004) also contribute to this view of academic careers by showing how academics can

benefit from the competency-based approach suggested for managing boundaryless careers.

Despite this tendency to think of an academic career as boundaryless, recent research has shown that not every career in academia is boundaryless. Dowd and Kaplan (2005), for instance, suggest a typology of U.S. academic careers that reports experiences of both boundaryless and bounded careers, while Musselin's findings (2009) confirm the diversity of academic careers in the U.S., France, and Germany. Despite national differences, she identifies the existence of two generic models, or prototypes, in these three countries: 1) the "Top Researcher," i.e., the academic who has been recruited primarily for his or her scientific reputation in the academic field, which gives such an individual superior access to positions in different universities; and 2) the "Good Citizen," i.e., the academic whose characteristic is a high level of adaptability and dedication to his or her university.

Other scholars go further than merely stressing the diversity of academic careers with regard to boundarylessness, finding that, in Germany for instance, academic careers are becoming even more bounded (Harley et al., 2004; Kaulisch and Enders, 2005). Thus, the allegedly widespread evolution towards increasingly boundaryless careers (Arthur and Rousseau, 1996) cannot be presupposed; further studies are needed to gain a more complete view of careers and a better understanding of the changes occurring worldwide.

The paradox of the boundarylessness of academic careers

In another contribution, research on academic careers shows that descriptions couched in terms of boundarylessness are not fully satisfactory. Although these careers – and more specifically those of "top researchers" – fall outside of organizational boundaries, they are no

less bounded in other respects. Promotion systems such as “tenure” (U.S.) or “full professorship” (France, UK) do not correspond to the idea of the “self-guided” and “freely-configured” career conveyed by the boundaryless career model (Feldman and Ng, 2007); an academic is not a free agent who “can move his or her career and research agenda fairly easily from one university to another” (Baruch and Hall, 2004: 249). In our view, academia is not very different from more traditional bureaucracies when it comes to careers: as in many professions (sometimes referred to as “professional bureaucracies”), strong rules affect individuals’ career choices. The “publish or perish” rule, for instance, indicates that access to certain positions is reserved for an elite group, particularly at prestigious universities and business schools. Stephan and Levin’s analysis (1997) of the specifics of academic research in the U.S. reveals further that, to succeed, academics must produce good science *and* must also be able to obtain funding for their labs and research; they conclude that in addition to individual skills, graduation from a well-known university is critical for young researchers who must convince funding providers that they can do good research. More generally, we assume that careers also depend on the quality of the resources to which academics have access (i.e., a rich data base, numerous conferences, well-known teams that know how to get published, etc.). Because these factors can be critical to achieving high level recognition, we suggest that career environment matters a great deal in academic career development and that careers are therefore more predetermined than is suggested by the boundaryless career approach.

In this perspective, academics who move may be seeking to enhance their career possibilities in academia, rather than moving “for the best opportunities, rewards and quality of life” (Baruch and Hall, 2004: 255). Thus, being “cosmopolitan” rather than “local” (Gouldner, 1957) does not necessarily liberate academics from career rules, and the very fact that careers

can cross organizational boundaries, or that academics can display agency to build their careers, does not mean the end of normative pressures to remain in collectively defined trajectories; economic, cognitive, and social “costs” continue to sanction non-conformity (Phillips et al., 2000).

But the bounded view of academic careers is not terribly convincing either. Indeed, although the “good citizen” career model is developed within organizational boundaries, it undermines other career boundaries. In particular, it exempts academics from rules that govern the “top researcher” model. Therefore, while bounded, the “good citizen” career model nevertheless tends to reduce career uniformity and predictability. By showing individuals that there are different paths to career development, it offers social actors the possibility of making selective and strategic use of the multiple norms and rules governing careers (Gläser, 2001); and, thus, (in keeping with the idea of greater career diversity) the good citizen model actually contributes to a more “boundaryless career world” (Arthur and Rousseau, 1996). In other words, the good citizen example (like that of the top researcher) confirms that the variance between bounded and boundaryless career notions can be misleading. While the boundaryless career literature posits that intra-organizational careers, by definition, offer little freedom, such careers do offer individuals greater creativity in pursuing their career choices.

Thus, we argue that the complexity of academic careers points up the limits of boundarylessness when seeking to account for contemporary careers and for individual discretion to shape them. To obtain a better understanding of the ways in which individual choices and environmental constraints mesh in the academic career sector, we propose to study the role and power of scripts guiding careers. The reason for focusing on that particular concept is that it favors an interactionist approach to understanding careers (Evetts, 1992), as

opposed to the boundaryless view that emphasizes the supremacy of the actor at the expense of the environment, which is supposedly becoming increasingly weakened.

Career and promotion scripts

Career scripts were initially developed in contexts where careers were reputed to follow clear and predictable paths (Barley and Tolbert, 1997; Barley, 1989). Before exploring whether scripts still matter regarding career-shaping, we will define what “scripts” and “promotion scripts” are.

What is a script?

The notion of scripts was proposed to describe the processes that drive individual choices and actions. It was initially defined as a schema “which describes events or behaviors, or sequences of events or behavioral patterns which are appropriate in a particular context” (Gioia and Pool, 1984: 450). For example, Shank and Abelson (1977) say that “eating at a restaurant” is a mental script made up of a set of sequences (i.e., entering the restaurant, reading the menu, ordering, eating, etc.) which follow a certain order, continue for a certain amount of time, and imply specific interactions. Our research builds on the fact that scripts apply to a larger set of class situations. Following Wright and Snell (1998), we consider that they enable individuals to associate a repertoire of actions with singular situations and thus provide guidelines for appropriate behavior independent of any specific prescription. Individuals can compare new situations with similar past experiences in order to decide which

of their “held in memory” schema to adopt. Scripts may be strong (as in the restaurant example) or weak (they provide a knowledge base that can help guide the interpretation of information, actions, and expectations, but without prescribing a detailed or fixed response). Each one is essentially an “input to memory schema” that helps individuals “understand situations” and that “provides a guide to behavior appropriate to those situations” (Gioia and Poole, 1984: 450).

In a nutshell, the notion of script suggests that “institutions set bounds on rationality by restricting the opportunities and alternatives we perceive and, thereby, increase the probability of certain types of behavior” (Barley and Tolbert, 1997: 94). Yet, this notion does not imply what could be criticized as “an oversocialized view of action” (Battilana and D’Aunno 2009: 36). Authors using it recognize that “practices and behavioral patterns are not equally institutionalized” (Barley and Tolbert, 1997: 96) and, since institutions may be more or less visible and more or less widely and deeply accepted (Tolbert and Zucker, 1996), individuals are not reduced to acting simply as “institutional automatons” (Battilana and D’Aunno, 2009: 47). Awareness and purpose still exist for individuals, who can choose the script that best suits them. However the notion of script carries the assumption that actors are knowledgeable, and that action is, therefore, largely organized according to “widely held definitions of the behavior and relationships appropriate for a set of actors” (Barley and Tolbert, 1997: 112).

The promotion scripts

Our focus on the factors governing individual actions regarding careers justifies our cognitive approach toward the notion of scripts, rather than our taking a behavioral approach. Indeed,

we are primarily interested in the representations of appropriate behaviors regarding careers as mobilized by individuals in given contexts, and less interested in the study of “the observable recurrent activities and patterns of interaction characteristic of a particular setting” (Barley and Tolbert, 1997: 98).

More specifically, in this paper promotion scripts designate the rules and norms that individuals have in mind when they think of their careers. Since they are derived from the models governing academic promotions, scripts account for environmental rather than individual career logic (Gunz, 1989). We posit, however, that promotion scripts can differ from promotion models because of the irreducible element of individual agency that is displayed when actors select and interpret the schemas on which to build their career decisions in their specific situations (Emirbayer and Mische, 1998). Promotion scripts, in this perspective, are defined as individuals’ interpretations and reconstructions of the promotion rules and models applied by those in charge of selecting and promoting academics. In our view, promotion rules may be more or less formal and thus the same generic terms also encompass promotion norms.

Before turning to our empirical analysis of the power of promotion scripts to explain contemporary academic career paths, we need to state that our emphasis on promotion scripts rather than career scripts does not mean that we are reducing a career to a vertical progression. We concentrate on the promotion scripts from which academics elaborate when reflecting on their career and their personal experiences of promotion (or absence thereof) because of our research question. We want to clarify whether the rules governing the promotion of academics are still in force in the allegedly boundaryless contemporary environments, or are they ignored? To show how individual agency and environmental constraints interact with regard

to career-shaping, at a time when the rules that govern them are reported to be growing weaker, we analyze how promotion models and scripts are used by academics.

Research method

Research context

Our research focuses on two academic disciplines as they are practised in France - Biology and History. Each has different traditions, particularly in terms of the organization of work (whether collective or individual), the resources for research (the proportion of project-based research contracts and of recurring university funding), and the procedures for evaluation of academic performance (criteria in use, degree of standardization). Yet, in both disciplines promotion to the rank of professor follows a similar two-stage formal process defined by legislation.

The promotion process unfolds as follows. A candidate applies to the National University Board (*Conseil National des Universités*) to qualify as a full professor. Once qualified, candidates can apply for open positions in any university; these positions are announced in an official governmental publication (*Le Journal Officiel*). Since candidates for promotion to the rank of full professor normally already hold permanent civil service positions in universities or public research centers, they can simply remain in their current position if their application fails. At each university where positions are available, applications are examined by a committee of peers whose only legal requirement is to assess candidates' CVs and to interview applicants. Each committee is free to use its own performance indicators, causing the actual evaluation procedures to vary widely from one recruitment to another.

Research design

Between 2006 and 2009, we conducted 75 semi-structured, face-to-face interviews; 30 were with members of promotion committees and 45 with other academics; all interviews were recorded and transcribed. This research was carried out in two large French universities: therefore our results may not apply at smaller, teaching-oriented universities.

The first round of 30 interviews, each of which lasted about an hour, aimed to identify the promotion rules applied by the committee members to 60 promotions. Committee members were asked to describe the practices and criteria they used to recruit full professors, and to reflect on past practices that would enable us to track changes that had occurred over the previous decade or so.

In the second round, we interviewed 45 academics, concentrating on identifying their subjective attitudes and reactions towards promotion models. Interviewees were first asked to freely describe their career paths, starting with their graduate studies. We then asked them about their past, present, and future career choices and experiences: 1) how they had made their career choices; 2) which person, institution, or circumstance guided or continues to guide their choices; and 3) who or what had hindered their projects or promotion goals or might do so in the future. In adopting this method, we follow other researchers (e.g., Cohen and Mallon, 2001) who believe that recounting their own experiences leads individuals to provide rich and nuanced insights regarding how they perceive their own role, that of their working contexts, and the interactions between the two. By comparing and contrasting these subjective perceptions with data collected from promotion committee members, we aimed to verify whether the descriptions obtained in this second round of interviews reflected personal opinions primarily or did they demonstrate a “true” knowledge of the specific promotion

practices in use. Moreover, studying both historians' and biologists' stories allowed us to observe how the experience of different career environments marks career interpretations and decisions and, thus, reveals the influence of specific promotion rules perceived by individuals.

We interviewed both assistant and full professors (see Table 1) and focused on three profiles: academics promoted to full professorship since the 1990s; assistant professors in the 35- to 50-year age bracket (when almost all promotions occur), and assistant professors older than 50, whose chances of promotion were diminishing. We considered the promotion experience of newly recruited assistant professors under the age of 35 to have been too limited to include them in this study.

Data analysis

Two of the authors carried out the interviews that were interpreted and analyzed by all three. In the first round of interviews we found that, although universities' expectations about candidates differed as did their promotion criteria, three models for key requirements in terms of skills and achievements rapidly emerged. To identify if and how academics use promotion scripts, we analyzed the arguments used by Round Two interviewees to explain their success (or otherwise) in being promoted, and their career decisions. Then, we checked whether these arguments pertained to the promotion models described by promotion committees' members. We also searched for any other criteria that Round Two interviewees may have had in mind. Two authors analyzed the promotion rules and models that interviewees referred to when commenting on their careers and explaining why they applied for promotion (or not) to full professorship. The transcripts were first coded independently by the two researchers, and then

compared and crosschecked until both authors could reach an agreement. A discussion with the third author aimed to check the relevance and the consistency of the coding rules. It rapidly appeared that Round Two interviewees mainly referred to two of the three promotion models described in Round One, but in a very dissimilar way. Thus, some described promotion rules as easy to decipher, while others presented them as uncertain and believed that luck mattered a great deal; differences also appeared regarding the compelling dimension of the rules. We then chose to focus on three questions: what are the main rules people have in mind and to what promotion model do they refer? Are the rules easy or not to decipher and do they pertain to strong or weak promotion scripts? Do interviewees agree or not to follow the script they have in mind? Although simplifying the career stories, this analysis enabled us to illuminate the influence of both environmental constraints and individual choices regarding career-shaping. It provided answer to two critical questions: What are the conditions for a promotion model to be used as a script? What are the dynamics around promotion scripts?

Results

The first round of interviews – with committee members – indicated that the recruitment of full professors increasingly depends on the profession's criteria of excellence regarding research and teaching activities; but universities retain a degree of latitude and define their recruitment criteria in relation to their specific standards (for instance, the priority they place on research vs. teaching). Likewise, the selection committee has full autonomy to evaluate and classify the candidates, and although committee members tried to use objective criteria, they tended to make judgments on a case-by-case basis and compared candidates against each other. As a result, the originally specified profile may well evolve during the selection

process, and a university wanting to recruit a “top researcher” may change its focus if an appropriate candidate fails to appear and may choose a very good pedagogue instead. Therefore, the first round of interviews highlighted that academic careers in France develop in a complex environment in which models for promotion do exist, but they are more or less structured and lack systematic application. More specifically, three generic models were identified by committee members, which we labelled “Star Scientist,” “Ambidextrous Professional,” and “Local Manager”. In the following sections, we explain those models and the differences we noticed regarding the way they apply in different career contexts (i.e., biology and history). Then, we explain how these promotion models can be turned into promotion scripts under certain conditions.

Three promotion models

Star scientists are recruited according to two criteria: their scientific excellence, measured particularly by their publications, and their “cosmopolitanism” (Gouldner, 1957), i.e. their involvement in national and international academic networks. Star scientists have high levels of reputational capital, they are “well known in their milieu,” and their works are authoritative in their scientific field. Geographic mobility is not routinely required but is appreciated by promotion committees, as it gives academics access to the most prestigious teams and projects and facilitates network building. Previous educational and administrative responsibilities are not key requirements for star scientists, who are exempt by most universities from “wasting their time and talent on non-scientific chores.”

Peer recognition is viewed differently for biologists and historians. Biologists are expected to

publish in leading international journals primarily, while a more varied array of publications is taken into account in judging historians, whose reputations stand just as much on honorary rewards (prizes, grants awarded by prestigious foundations, etc.). Since many prestigious institutions are located in Paris, time spent at a Parisian university helps historians to build up a stronger reputation. Participation in international networks is valuable for both historians and biologists, but more so for the latter. Another striking observation is that age is an important selection criterion for promotion as a star scientist in biology; this is generally not the case in history, although certain universities do appreciate indications of precocious excellence, such as graduation from a *Grande Ecole*, or having a prestigious publisher for one's doctoral dissertation. Finally, star scientists in biology also manage large scientific projects and coordinate national or international research networks, and foreign researchers are frequently recruited for these positions.

The star scientist model accounts for approximately two thirds of the 60 professorial recruitments described by committee members in this study. Thus, although universities' recruitment policies change over time, star scientists have, a priori, little to worry about: they benefit from high legitimacy in academia and numerous promotion opportunities that make their careers boundaryless to some extent; on the other hand, however, these academics have to satisfy strong promotion rules to succeed.

Ambidextrous professionals must meet two criteria. First, while expectations regarding their scientific excellence and international reputation are lower than for star scientists, they must demonstrate additional capabilities in education management and administrative activities. Second, they should combine a moderately "cosmopolitan" orientation (i.e., being involved in local and national networks) with a strong "local" orientation (i.e., a strong involvement in

their university's projects - setting up new degrees, developing industrial partnerships, sitting on university boards, etc.). Geographical mobility is not a critical criterion.

In biology, project management and research contracts are essential selection criteria, while they are marginal in history. On the other hand, teaching skills are of prime importance for “ambidextrous professionals” in history, where professors must be capable of teaching a wide selection of courses and preparing students for prestigious and competitive exams (like the French “*agregation*”).

This ambidextrous model – which represented about one third of the 60 promotions discussed with the committee members – opens promotion opportunities to those who are not star scientists. Because the promotion criteria of “ambidextrous professionals” are somewhat vague (especially in contrast to the “star scientist” model) and are adjusted on a case-by-case basis, the legitimacy of “ambidextrous professionals” is sometimes “questioned” by academics outside the promotion committees – and these discussions may well continue after recruitment. In other words, the model conforms to the notion of a bounded career model in the sense that promotion is clearly linked with the needs and priorities of the employing organization; but it is nevertheless a weak model, with career paths that are not easily predictable and are still subject to negotiation. Therefore, contrary to the dominant representations of an organizational career suggested by the boundaryless approach, this model does not pertain to careers bounded by strong career patterns.

The third promotion model, local managers, refers to academics who devote themselves to the smooth functioning of their university. They are usually close to retirement and have been heavily involved in collective interest tasks at both university and departmental levels (course management, staff management, health and security, etc.) and have often been released from

some teaching duties to address these tasks. Many have also given up all research activity (and thus, too, any “cosmopolitan” orientation). They are promoted according to specific internal promotion procedures, where rewards for past service count more in the decision than expectations regarding their future academic contributions. This model is rarely used, and concerned only one of the 60 promotions discussed by committee members.

From promotion models to promotion scripts.

The academics encountered during the second round of interviews had fairly intimate knowledge of promotion rules, both because they (or their colleagues) had participated in promotion committees and because of their personal experiences as promotion candidates and, second-hand, their colleagues’ experiences. Even though interviewees knew that criteria for the recruitment of full professors can and do change from one recruitment to another, the general feeling was that the requirements for promotion have increased over the last few decades. Opportunities for promotion have also become less certain, with departments running the risk of losing positions if the university reallocates resources to new fields that are considered more promising or relevant. Thus, despite the notion of promotion models introduced in this paper, interviewees of the second round saw the promotion process as very demanding and its outcome as uncertain: they knew that only a minority could expect to be promoted as star scientists, and they described the ambidextrous professional model as weakly institutionalized.

Although promotion can not be presupposed (except perhaps for a few star scientists), interviewees are very sensitive to the rules that seem to govern it and – by the same token –

careers. Concerned about their future, they tend to structure their day-to-day activity in response to the performance demands they perceive, and even those with little or no chance of future promotion refer to promotion models when reflecting on their careers and making related decisions: they stress for instance their refusal to organize their life around publishing, emphasizing their desire to work at their own pace on subjects they like. While such claims may seem to be about “saving face” (Brown et al., 2008) and justifying failure, they nevertheless show the importance of promotion rules and models for interviewees who are 41 out of 45 to use them to account for their individual career paths and choices.

Before exploring in more depth how interviewees utilized promotion models and scripts, we note that 26 of the 45 interviewees referred to the star scientist model when explaining their careers. Even though their views of this model differed, depending on the examples they chose, interviewees with this model in mind emphasized how they managed (or why they failed) to build their scientific reputation and to have prestigious publications. Fifteen of the 45 referred to the ambidextrous professional model, stating that they knew that promotion is possible (albeit uncertain) for those who can demonstrate other capabilities than the scientific ones, but they expressed insecurity about promotion criteria. The model of the local manager was not evoked by any of the interviewees as a formula to guide cognitive schema for decision-making. Finally, four interviewees reported acting without referring to any of the promotion models.

Interviews show that the promotion models that individuals use to make sense of their careers can change over time, according to their experiences – in particular when individuals have to give up their dreams of being star scientists and try to develop themselves as ambidextrous professionals instead. In this paper, we mention only the last promotion models to which these

interviewees referred (cf. Table 1).

Conditions that turn a promotion model into a promotion script

Interviews analysis shows that promotion models must fulfill three conditions if they are to be used as scripts that inform individual career decisions: credibility, legibility and legitimacy.

Condition One: Credibility. While some interviewees knew the “local manager” promotion model, none referred to it when reflecting on their career. This model seemed to be applied too rarely and too randomly to serve as a basis for individual promotion strategies, even for those who were aware of it. Contrary to the star scientist and ambidextrous professional models, the local manager model lacks credibility as appropriate knowledge (Barley and Tolbert, 1997) on which to build career decisions. Therefore, this model does not function as a script for academics, since they cannot use it to make sense of their career situations and act according to the information it conveys (Gioia and Poole, 1984).

Condition Two: Legibility. Another element that explains the role of promotion models for individuals is their legibility, i.e. the possibility to derive them from the “signs” individuals may find in their environment. Thirty-three of the 45 interviewees stated that the promotion models were intelligible and that they had no difficulty in deciphering what would be expected of them if they were to be promoted. Those who related to the star scientist model (26 of the 33) were all particularly clear about what was expected of them:

“What is crucial for promotion is the number of published books, the number of articles published in peer-reviewed journals, articles co-published with foreign

colleagues, chapters in edited volumes, editorial responsibilities, also communications at conferences and organization of colloquia. I consider that I have more or less the range of activities that is needed. I organized an international symposium two years ago and that is what is required. One thing I have not done, and which is expected, is to manage a large research contract.” (Interview 18, star scientist, assistant professor, History)

The expectations for ambidextrous professionals, however, were clear to only about half of the interviewees who referred to this model (7 out of 15):

“It's true that while papers from my PhD aren't out, it's still a bit early. [...] My aim is to optimize my career a bit more every year. [...] I also try to give a few hours of lectures.” (Interview 14, ambidextrous, assistant professor, Biology)

The other eight interviewees who referred to the ambidextrous professional model expressed concerns about the actual rules that governed promotions, and they questioned what achievements could increase their likelihood of promotion as an ambidextrous professional.

“I am in charge of the new PhD program and so now I've got PhD students. It's not bad, I do have benefits. But it's true that from a career point of view, it's not that easy. I don't really know if I'll manage to get a full professorship. [...] I'll see how things turn out but, in any case, I can't speculate too much.” (Interview 37, ambidextrous, assistant professor, Biology)

They lacked strong clues about publication standards and about the appropriate level of managerial involvement. The sense of doubt expressed by ambidextrous candidates is all the more remarkable given that the legitimacy of the promotion of academics with this profile is

sometimes questioned and that ambidextrous candidates run a high risk of being eliminated from the running if a star scientist applies for the post they had sought.

Finally, four out of the 45 interviewees blamed the lack of legibility of promotion rules in explaining why they could not build on any of the promotion models to make sensible career decisions.

“Being promoted to professor is very confusing. One needs excellent scientific achievements and to be extremely capable [...]. But even that isn’t enough. Contacts also matter and maybe luck.” (Interview 45, assistant professor, no script, History)

So promotion models do not turn into scripts for all interviewees; and when they do, the script may be strong (the promotion rules were quite clear for 33 out of the 45 interviewees), or weak (for eight, promotion rules were difficult to decipher).

Condition 3: Legitimacy. The last difference we found in the way individuals use promotion models pertains to the fact that of the 41 academics who referred to a promotion model, 23 sought to follow the perceived promotion rules while 18 explained their refusal (or inability) to do so. Yet, the latter interviewees admitted that, as a consequence of their refusal, they had to give up any hope of promotion and craft career alternatives (e.g., focusing on other interesting activities) that compensated for not being promoted. Therefore, those who seek promotion and those who do not both corroborate the legitimacy of promotion models, and strengthen them through enacting them.

Thus, our research suggests that while committee members’ practices influenced the credibility of promotion models, academics were more concerned with their legibility and legitimacy.

To sum up, while three promotion models emerged from the first round of interviews (that applied differently for historians and biologists), the second round indicates that only two of them (the star scientist and the ambidextrous professional) were used as promotion scripts. Indeed, our results indicate that promotion models must be deemed sufficiently credible, legible, and legitimate if they are to be used as scripts that guide career decisions.

The next section explores in greater depth the power of promotion scripts to shape careers, and it identifies four specific dynamics that further illuminate the interplay of individual agency and environmental constraints.

Dynamics around promotion scripts

There are many explanations for the differences in individuals' perceptions of the credibility, legibility, and legitimacy of promotion models. We will not detail them here because our priority is to explore how promotion scripts (i.e., interviewees' interpretations and reconstructions of promotion models) orient career choices, even when interviewees understand that the perceived promotion rules cannot be taken for granted or if they refuse to comply with the rules of a given promotion script.

We describe four dynamics around promotion scripts: the first two characterize interviewees who have strong promotion scripts in mind; the third characterizes those with weak scripts; the fourth concerns those with no script to act upon.

Following the script, and being actively compliant. For eight biologists and seven historians promotion models were sufficiently credible, legible and legitimate to provide them

with the clues needed to make career decisions. While their careers followed a strong script, they still emphasized their individual agency, linking the likelihood of promotion to their pro-activity and reducing environmental influences to “catalysers” that can facilitate individual projects. Thus, careers are seen to depend mainly on the individual’s actions, i.e. it is the individual’s responsibility to access the resources necessary for promotion. Only three interviewees referred to the ambidextrous professional model, the other 12 to the star scientist model; nine out of these 15 have been promoted to full professorship.

Specifically, the biologists stressed the need to be pro-active in searching for premises, contractual funding, PhD students, positions, and finding prestigious research subjects.

“When I was 35, I wanted to be more independent and to have my own team, but that was very difficult in Paris. There were more opportunities in other regions. I came here in order to be autonomous and I wanted to start and develop something myself. It wasn’t possible to find available space the Pasteur Institute. I came here to develop my own scientific project, and I finally chose Smallpox because it had not been studied extensively.” (Interview 11, full professor, star scientist, Biology)

The historians, on the other hand, stressed their ability to obtain grants, to access archives, to free up time from their teaching schedules for the research that could build up their personal reputations, and (like the biologists) they emphasized their role in networking.

“I went to conferences and remained in touch with the organizers, and all of a sudden I found I had enlarged my networks, notably in Germany. I also had a very large Erasmus network, and so I had contacts in Italy, Spain, Portugal, and, Belgium. Yes, it has counted to develop my research. I could rely on the networks I created when I did

my doctoral dissertation or when I did a lot of work on the history of the car industry.”

(Interview 6, full professor, star scientist, History)

Regardless of the promotion script they may utilize, individuals falling into this category do not see promotion rules as constraints; rather, they describe them as frameworks for individual action. Thus, strong scripts pertaining to deeply institutionalized promotion rules (such as the need to publish at a rapid pace, to develop international networks, and to benefit from international mobility) are not seen as hindering individual agency in their academic careers. Quite the contrary! They are regarded as enabling academics to take the initiatives necessary to fulfill their promotion criteria, to organize themselves and make choices in their professional and personal lives.

Renouncing promotion and searching for alternative career development opportunities.

Eighteen out of the 45 interviewees (11 biologists and seven historians) explained that they could not follow the rules of a promotion script that did not correspond to their values, or for which they do not have the necessary resources. Fourteen referred specifically to the star scientist model and four to the ambidextrous professional. Even if the promotion model they had in mind was credible, legible, and legitimate, they considered it “not worth it” in their personal case. Costs judged to be too high included those linked to the intense effort required to meet the selection criteria. Some academics also rejected the demands which weigh upon full professors. Requirements such as mobility, increased workload, having to give up benchwork (biologists) or the archives (historians), and the need to devote a great deal of time to administrative work, were put forward to explain why interviewees renounced promotion (or failed to be promoted). In the case of star scientists, one may add refusal to publish in English; and for the ambidextrous candidate, the refusal to engage in numerous administrative

and educational tasks. Interviewees in this category described the perceived promotion rules as constraints. Faced with strong scripts, interviewees portrayed themselves as arbiters, evaluating the pros and cons of each career option, and ranking their personal and professional priorities. However they put much less emphasis on their agency around resources and network building than did those following the active compliance dynamic.

“I never really tried to get promoted for a very simple reason: it’s that I couldn’t imagine doing ecology far from the countryside and being far from the mountains [...]. When you’re here on Sundays... You see what I mean?” (Interview 26, assistant professor, star scientist, Biology)

Whereas some interviewees reported normative pressures for assistant professors to become full professors, others considered that the increasing number of non-promoted makes their situation easier to live with. A few also stressed that the incentives to become a full professor are not very compelling.

“I’m not in a hurry, particularly as there is no real difference in remuneration to justify trying to progress quickly. Promotion means attending more responsibilities and also having less time to look after the children.” (Interview 16, assistant professor, star scientist, History)

Thirteen of the 18 people in this dynamic had failed to be promoted, or they predicted that they will not be promoted, and they linked their non-promotion to their rejection of the promotion scripts. However, despite their initial refusal to comply with certain script requirements, five were promoted, which they mainly attributed to changes in their environment.

“In order to become a professor I had to join another research group. I could not, because I didn’t want to leave Paris. My husband provided the answer in the end because he was transferred to another part of the country. And that’s how I applied for this position here. I just followed my husband.” (Interview 22, full professor, star scientist, Biology)

Our data indicate that, even when individuals do not comply with promotion rules, strong promotion scripts still influence their career choices. Once individuals have given up hope of being promoted, they may decide to adjust their work/life balance accordingly (or engage in projects like writing a book, etc.) in order to render the cost of refusing the promotion script acceptable. As they reject some of the promotion script rules, they generate new discourses to justify careers without promotion, i.e. careers that do not have to meet the same performance criteria. Some deny interest in becoming a professor, and the majority emphasizes the benefits of remaining at the rank of assistant professor (quality of life, the chance to focus on chosen activities, etc.). Those discourses generated in response to strong promotion scripts provide additional information about appropriate behaviors available, particularly to those who do not have the inclination or the resources to comply with the rules of strong promotion scripts and who have to imagine a future without a professorship. Thus, academics renouncing promotion can find in the discourses on strong promotion scripts, the clues they need to make career choices.

Following a weak script and dealing with missing information. Eight out of the 45 interviewees (five biologists and three historians) tried to adapt to a weak promotion script, drawing from the ambidextrous professional model. To increase their likelihood of promotion despite the lack of legibility of the promotion rules, they tried to take advantage of any

opportunity the organization might offer and invest as much as possible in research, teaching, and administrative tasks. Uncertainty motivated them to gather together as many strong cards as they could in order to respond to the widest possible range of requests and opportunities for promotion.

“If a post becomes vacant, I’m ready.... I am aware that there are posts which are already ear-marked for a particular person, but there are other posts that are more open. It’s up to me to keep track of events and know when and how to go after them.”

(Interview 35, assistant professor, ambidextrous professional, History)

While interviewees in this category showed a certain willingness to act, they still felt very vulnerable and dependent upon their environment. Making decisions regarding which responsibilities to accept in order to increase the possibility of promotion was difficult. For them, a weak script did not mean more freedom; on the contrary, they felt obliged to seize any opportunity that showed up.

Many of these people had refused geographic mobility, but they still hoped to be promoted. Such interviewees - like those who refused to comply with the perceived promotion rules - show that career choices are, in fact, possible. They do not have to conform to rules as strong as those governing the career of a star scientist. But the influence of individuals is still limited: they have to live with the opportunities presented by the environment, and even a weak promotion script can require tough trade-off decisions.

Ignoring promotion models and relying on individual choices. A script’s weakness or the lack of a script can prompt some to ignore promotion models and opt for a laissez-faire attitude. With only four members (two historians and two biologists), this last group is a tiny

minority. Without roadmarks that would help “construct” their promotion, even the three who were promoted thought it was all a matter of luck. This attitude has various explanations, including the fact that promotion rules were less well-defined in the past, and also the belief in the current rarity of posts in their domain. Deprived of any knowledge about appropriate behavior regarding promotions, interviewees in this category considered that it is up to each academic to determine the content and the timing of his or her activities. In this case, it was the strong feeling of a lack of control over their chances of promotion (rather than its cost) which led them to dispense with promotion rules.

“I prefer to tell myself that I won’t be promoted to professor. That way I won’t be disappointed. You need luck. Lots of it. A lot of posts are disappearing, but if I am lucky enough {to be promoted} I’ll be more than happy. {...} As a result, I’m doing my “habilitation” [The French diploma one should get to supervise students preparing a doctorate] at my own pace. There are no posts in sight here so I’m in no hurry. I’m going to write a book on a subject I find passionately interesting.” (Interview 45, assistant professor, no script, History)

These individuals feel totally dependent on their environment and believe that promotions open up, at a given moment, in response to a specific need of the university, which could not have been anticipated. Some academics may suddenly fulfill that need, becoming “the man or woman of the moment”, but it is still their extreme dependence that acts as their ultimate liberating factor and allows them to dispense with the idea of using a promotion script to make career decisions.

Discussion

Our results confirm that the variance between bounded and boundaryless careers does not properly account for the complexity of academic careers that can be viewed as simultaneously bounded and boundaryless. Therefore, rather than discussing the boundarylessness of academics' careers (Harley et al., 2004; Kaulisch and Enders, 2005), we highlight the benefits of a theoretical framework that accounts for the duality (Gunz, 1989; Evetts, 1992) of academic careers, recognizing both environmental constraints and individual choices and creativity. More specifically, we show the power of promotion scripts even when careers are not totally predictable and promotion rules are more or less deeply institutionalized. The following paragraphs consider in greater detail the challenges that our research raises for the boundaryless career literature and provide theoretical arguments to support our findings about the power of promotion scripts in contemporary environments.

Three challenges to the boundaryless career literature

First, we find that environmental weakness should not be overestimated. Only four of our interviewees could not rely on a promotion script when making their career decisions.

Second, we show that the absence of widely institutionalized rules governing promotions do not necessarily transform academics into "free actors" (Pink, 2001). Thus, while they portrayed themselves as being driven by their individual choices, the four interviewees who ignored promotion models nevertheless emphasized that they felt almost no control over critical events (such as their promotion). They explained that they must adapt to university decisions, with no possibility of making credible plans for their future. Even in these cases,

interviewees considered external factors (such as luck), rather than individual choices, as being decisive in their promotions. In the same vein, the eight interviewees striving to follow a weak script admitted that they made individual choices (e.g., declining geographic mobility, refusing to follow the demanding star scientist model), but they still described promotion as constraining and emphasized the need to comply with environmental requirements, feeling that they must seize any opportunity to increase their chances of promotion. Their experiences confirm that managing a career can be much more demanding than the boundaryless perspective suggests, especially for those people wondering what criteria would eventually be used by recruitment committees.

Third, besides highlighting how environmental constraints persist in limiting individual choices (Gunz et al., 2007; Ituma and Simpson, 2009; O'Mahony and Bechky, 2006), our research challenges the way the boundaryless approach to careers contrasts strong and weak environments and sees individual agency as characteristic of weak environments (Arthur and Rousseau, 1996; Kanter, 1989; Baruch and Hall, 2004). Indeed, we do more than show that individual choices are limited for academics with a weak promotion script - we find that strong scripts facilitate individual choices to some extent. Thus, interviewees seeking to comply with clear and strong performance requirements also stressed that they had to act as agents in organizing their work and personal lives. They behaved compliantly but also presented themselves as having autonomy and responsibility, thus portraying themselves in terms quite similar to the free actor of the boundaryless career theory. In a similar vein, we show that strong promotion scripts can actually ease the creation of alternative career strategies that aim to compensate for the non-promotion of those who refuse to comply with promotion rules. More generally, we conclude from our results that strong and demanding scripts - like that of the star scientist - generate actions (such as organizing one's professional

and private life, and creating justifications for career “choices”), both from those who agree to follow them and from those who do not. Therefore, we contend that such scripts do suppose individual agency. In other words, our data demonstrate that individual agency does exist in both strong and weak environments because academics have to fill in the gaps (or incompleteness) in both weak and strong promotion scripts that may be difficult to decipher, that do not articulate how to meet performance requirements, or do not specify careers for the non-promoted.

To sum up, we find that individual agency does exist regardless of the strength of environments, but it is oriented and restrained by individual perception of environmental constraints (promotion rules and models) and opportunities (the chances to compensate for non-promotion by working at one’s own pace, for instance). Thus, while individual choices about careers do exist, our study shows that they are better understood in conjunction with the scripts that shape how individuals project themselves towards becoming a professor (or not) and how, in their situation, they analyse the possibilities and potential benefits of following certain rules. Scripts indicate how to play with the promotion models in a given environment.

While our results are necessarily marked by context, elements supporting the argument that promotion scripts and the rules behind them retain considerable power are developed in the following paragraphs.

The persistent influence of promotion rules

In contrast to the boundaryless approach, which sees the opening up of organizational career boundaries as creating more room for career choices, we find that the ending of organizational

careers can result in the strengthening of promotion rules and the creation of new boundaries. Indeed, if the possibility of moving from one university to another permits access to new posts (in particular for star scientists), it also implies tougher competition between candidates for each position. We can expect this to lead to new forms of segmentation of the academic labour market, containing some very rewarding and highly coveted posts, and others that are more accessible but lack the same career development opportunities. Thus, inter-organizational careers and career development are easily obtained by star scientists with high legitimacy, but less so for those who do not comply (by refusal or failure) with the widely recognized promotion rules of strong scripts. In this perspective, we argue that career path diversification - at the heart of the boundaryless approach to careers - parallels the maintenance - or even the reinforcement - of informal career boundaries (Gunz et al., 2000).

Promotion rules are both constraints and resources

Our results also challenge the boundaryless career literature for a theoretical reason: that it builds on a too-negative view of rules (Kanter, 1989). More specifically, our interviews illustrate that career rules are not solely constraints for individuals. Although certain promotion rules (like “publish or perish”) are denounced, clear rules also have their benefits. That is particularly evident to those striving to follow a weak promotion script: they must redouble their efforts to be aware of opportunities and accept numerous forms of responsibility, but without knowing if their hard work will be profitable in the long run. In other words, the restrictive side of the rules must not obscure the fact that, without them, people find themselves in situations of heavy dependence, with no clues for making career choices.

Considering career rules as resources that help individuals decide the steps to take and behaviors to adopt, rather than as mere restrictions, is not new (Giddens, 1984; Abel, 1996; Gunz, 1989), but it nevertheless contravenes the boundaryless career literature which suggests that individuals themselves will contribute to the weakening of their career environment (Arthur et al., 1993; Arthur and Rousseau, 1996) by taking personal initiatives based primarily on individual career orientations. More precisely, we agree that “agents are capable of putting their structurally formed capacities to work in creative or innovative ways” (Sewell, 1992: 4); with their discourses and decisions, academics can fill out the incompleteness of promotion models and may provide complementary knowledge where needed. However, in our research we observed that individuals usually preferred to adapt to those existing career rules that they could decipher, and they reproduced “appropriate behaviors” rather than relying on individual choices that could jeopardize their chances for promotion and their careers (Wajcman and Martin, 2001; Dany, 2003). Although several interviewees mentioned the absence of incentives for becoming a professor in France, stigmatising pressures were also evoked. Actually, most of the academics considered that promotion gave access to certain resources (e.g., budget, time) and the possibility of realizing certain projects, which made indifference to promotion rules and scripts unlikely. At the very least, academics need to understand the price of certain choices, such as refusing to accept new responsibilities. Therefore, and contrary to the boundaryless career literature, we suggest that only the absence of credibility, legibility, or legitimacy of promotion models induces individuals to make career decisions based solely on their personal desires, and to ignore the guidelines they find in their environment that indicate how to play with the perceived promotion rules. In other words, our research shows that interviewees cannot apply promotion scripts automatically. As suggested by Emirbayer and Mische’s analysis (1998), they have to assess a script’s relevance according

to their own current situation and expectations for the future. Yet, in our view, promotion scripts are all the more important to individuals because, like any rules (Karpik, 1996) or domination systems (Willmott, 1993), they fulfill both a facilitating and a protective role for those who agree to submit to them.

The power of promotion scripts

Our perspective admits to a great diversity of individual experiences in career matters; and it also acknowledges that not all academics will comply with the perceived promotion rules, in particular since some may lack the resources to do so. Nevertheless, our findings suggest a strong environmental influence on careers due to the attention academics pay to promotion scripts in order to manage their careers in a pragmatic and risk-free manner, and to benefit from a greater understanding of what needs to be done in order to succeed - or to limit the “damages”. Where possible, individuals who are considering their career and the most appropriate actions to undertake will follow the patterns they see succeeding around them (Gioia and Poole, 1984). Our research confirms, though, that the influence of the environment is not total: academics’ selection, appreciation, adjustment, and application of career information (Emirbayer and Mische, 1998), as well as their discourses to justify day-to-day career decisions actually contribute to knowledge creation. Thus, academics both shape promotion scripts and increase their influence, making them more legible and legitimate and simultaneously providing guidelines about how to enact them. Therefore, while individuals tend to believe that institutions exist independently and are the basis of their actions (Duberley et al., 2006), our research shows that actions and structures are interlinked; and we suggest that it is the very fact that scripts are both the basis *and* the result of individual action

that largely explains their power - even in the allegedly boundaryless environments. Indeed, we argue that promotion scripts are all the more powerful and better regarded by academics because they are likely to adapt to the new situations academics face. From this perspective, we consider that environmental weakness would have to be very severe before individuals should dispense with promotion rules and promotion scripts.

Conclusion

This paper concentrates on academic careers in order to challenge the boundaryless career approach and show the power of promotion scripts, even in allegedly weak environments. First, we underline that the boundarylessness concept is misleading, since inter-organizational careers - like those of star scientists - are bounded in some respects, while the intra-organizational and allegedly bounded careers of ambidextrous professionals may provide more freedom for those academics who do not fit the star scientist model. Second, we study how scripts mark careers in contemporary environments. We do this to overcome the ambiguity and limitations of the boundaryless career approach, which does not properly account for the way environmental constraints (promotion rules) and individual choices (agency) interplay in shaping careers. We show that even individuals with weak promotion scripts often feel constrained, while those using strong promotion scripts emphasize their agency, pointing out that they must invent the measures (e.g. organizing their own time) that allow them to attain the required levels of performance for being promoted. We further contend that the influence of environment acting through promotion scripts does not hinder individual agency, and we highlight four dynamics around scripts that account for individual agency: following a strong script and being actively compliant; renouncing promotion and

searching for alternative career opportunities; following a weak script and dealing with missing information; and ignoring the promotion model altogether and relying solely on individual choice. Third, we define scripts as individuals' reconstructions of promotion models, derived from both their interpretation and enactment of promotion rules. Rather than detailing the content of every script, we identify the conditions that turn promotion models into promotion scripts and we highlight how academics themselves foster promotion scripts through their discourses and actions. Fourth, while we acknowledge that people are wary of inconsistent promotion rules, we suggest that the stakes related to careers and promotion moves are so high that few individuals are capable of detaching themselves from decipherable promotion scripts. In our perspective, individuals who are faced with environmental weakness must find new clues - and while they may have to create their own rules, we observe that they usually build on the examples they know and the discourses they have heard in order to make better-informed career choices. Accordingly, we contend that the power of scripts relies on the fact that scripts are not just constraining - they are also resources, which are all the more valued when they ease difficult career shaping decisions.

Our demonstration of the relevance of promotion scripts for understanding careers even in boundaryless and weak contexts (Arthur and Rousseau, 1996; Baruch et al., 2004) opens new roads for research. We need to know more about the accuracy of those scripts that individuals mobilize in contexts where promotion rules are becoming blurred, and to explore why a given script is followed or rejected. Addressing these issues would enhance those analyses that are carried out solely in terms of personal choice; it would also permit identification of inadequate career representations that might hinder certain projects. It might also indicate where forms of discrimination actually explain exclusion. We also suggest further investigation into the range of environments, especially contemporary environments, where

the notion of promotion scripts could usefully be applied. The goal then would be to help move career literature beyond a simple discussion of degrees of boundarylessness, and into the realm of research that can embrace wider issues, especially concerning the constraints that continue to weigh on individual career choices.

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Table 1. The sample

	Inter-view Number	Sex	Age at Time of Interview	Status	Age when Recruited as Assist. Prof.	Date of Promotion	Age when Promoted as Full Professor	Script	Dominant Form of Dynamic
History	1	male	45	Full prof.	30	2001	39	star scientist	Following the script and being compliant
History	2	male	59	Full prof.	32	1985	36	star scientist	
History	3	male	53	Full prof.	39	1998	44	star scientist	
History	4	female	35	Assist. prof.	32			star scientist	
History	5	female	49	Full prof.	36	2008	48	star scientist	
History	6	female	49	Full prof.	35	2007	47	star scientist	
History	7	female	42	Assist. prof.	31			star scientist	
Biology	8	male	38	Assist. prof.	28			star scientist	
Biology	9	male	44	Full prof.	36	1998	36	star scientist	
Biology	10	female	51	Assist. prof.	30			star scientist	
Biology	11	female	54	Full prof.	28	1987	35	star scientist	
Biology	12	male	57	Full prof.	31	1999	50	star scientist	
Biology	13	female	35	Assist. prof.	33			ambidextrous	
Biology	14	female	39	Assist. prof.	29			ambidextrous	
Biology	15	male	40	Full prof.	34	2003	37	ambidextrous	
History	16	female	39	Assist. prof.	32			star scientist	
History	17	female	38	Assist. prof.	31			star scientist	
History	18	female	43	Assist. prof.	37			star scientist	
History	19	female	58	Full prof.	37	2000	49	star scientist	
History	20	female	54	Full prof.	41	1998	43	star scientist	
History	21	female	48	Assist. prof.	35			star scientist	
Biology	22	female	59	Full prof.	23	2006	59	star scientist	Renouncing promotion and searching for alternative career development opportunities
Biology	23	female	35	Assist. prof.	28			star scientist	
Biology	24	female	40	Assist. prof.	29			star scientist	
Biology	25	female	56	Full prof.	36	1998	48	star scientist	
Biology	26	male	56	Assist. prof.	28			star scientist	
Biology	27	male	58	Assist. prof.	29			star scientist	
Biology	28	female	61	Assist. prof.	26			star scientist	
Biology	29	female	64	Full prof.	32	1993	51	star scientist	
Biology	30	male	39	Assist. prof.	33			ambidextrous	
Biology	31	male	40	Assist. prof.	31			ambidextrous	

Biology	32	female	42	Assist. prof.	33			ambidextrous	Striving to follow a script and dealing with missing information
History	33	female	42	Assist. prof.	35			ambidextrous	
History	34	male	44	Assist. prof.	29			ambidextrous	
History	35	male	60	Assist. prof.	44			ambidextrous	
History	36	female	40	Assist. prof.	31			ambidextrous	
Biology	37	female	40	Assist. prof.	31			ambidextrous	
Biology	38	male	40	Assist. prof.	37			ambidextrous	
Biology	39	female	46	Full prof.	23	2005	45	ambidextrous	
Biology	40	male	51	Full prof.	25	2000	45	ambidextrous	
Biology	41	female	52	Full prof.	41	2000	46	ambidextrous	
Biology	42	male	57	Full prof.	32	1994	45	No script	
Biology	43	male	60	Full prof.	43	1994	48	No script	
History	44	male	62	Full prof.	30	1995	48	No script	
History	45	female	39	Assist. prof.	32			No script	