

CHAPTER 2.

**CASE STUDIES ON CHANCE
ENCOUNTERS IN LITERACY
DEVELOPMENT IN LATIN
AMERICAN RESEARCHERS**

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Most people can identify chance encounters or serendipitous moments which caused a life change. Chance encounters happen all the time. The effects they produce on people's lives vary from life changing, only slight effect, to no effect. In explaining the intensity of the influence of chance on lives, much of the literature on chance encounters cites Pasteur's comment (however, related to scientific discovery) that chance favors the prepared (e.g., Díaz de Chumaciero, 2004). This is the crux of our overall aim in this paper.

While the literature acknowledges the presence of chance encounters and their effects on professional development, very little seems to focus on chance in academic careers (Kindsiko & Baruch, 2019). Most academics, however, can point to instances of life changing chance encounters and fortuitous events in their career development. In spite of this, most infrequently, if ever, share these happenings with students—either in their writing or discussions (Goggin & Goggin, 2018). Kindsiko and Baruch (2019) in their study of doctoral candidates' career development regard this omission as a significant factor needing revision in current Ph.D. program design and recommend that future Ph.D. students “be made aware of the levels and impact of the possible chance events that may emerge during academic careers” (p. 136). Rice (2014) also notes the widespread lack of attention to chance found in traditional theories of career development. He goes on to develop a detailed review of newer career theories and how they have addressed the presence of chance in career development. Of the theories reviewed, only Krumboltz's Happenstance Learning Theory (2009) which is based on his earlier theory, Planned Happenstance, seems to offer any specific pedagogical strategies (Mitchell et al., 1999).

Before we can attempt to address this apparent lacuna, we need to look to theory to help us understand the role of chance in professional development and

what characteristics people have which are seen to engage chance events, fortuitous encounters, or serendipity as a “catalyst for change” (Cabral & Solomone, 1990, p. 11). Thus, in this paper we seek to understand what the observed characteristics of a cohort of participants were (based on the theoretical models discussed below) which made them receptive to fortuitous chance encounters in their academic career development. With that knowledge, we attempt, in the final section of the paper, to suggest pedagogical interventions in incipient and novice academic researchers’ professional development which could help them seek out chance encounters and use them for positive academic literacy and career development.

THE LITERATURE ON CHANCE ENCOUNTERS AND SERENDIPITY IN PROFESSIONAL DEVELOPMENT

What are chance encounters? The simplest definition is that chance encounters are an “unintended meeting of persons [or previously unknown symbolic objects, e.g., books and experiences] unfamiliar to each other” (Bandura, 1982, p. 748). Chance encounters are not necessarily good. Sometimes lives go wrong as a result of an unfortunate chance encounter (Bandura, 1982). However, for the purposes of this paper, we restrict our discussion to chance events which led to career changing / enhancing outcomes.

The most recent study we came across on chance encounters (Olshannikova et al., 2020) examines the influence and importance of incidences of “social serendipity” in knowledge workers’ professional development. In Solomon’s (2017) paper on temporal aspects of info-serendipity, the author summarizes the wide scope of studies in chance and serendipity carried out after the turn of the 21st century. Besides the obvious discipline of science, technology and medicine, the author cites studies in the areas of law, business, humanities and social sciences, and the topic of his paper—information sciences. Other researchers have looked at chance in the career development of female university graduates, non-professional workers, students, and workers and professionals in career transitions (comprehensively reviewed in Rice, 2014). More closely aligned with our study, we find some published research in the areas of career development (e.g., Bright et al., 2009; Kindsiko & Baruch, 2019; Mitchell et al., 1999; Rice, 2014), and rhetoric, writing, and literacy research (e.g., Mohammed & Boyd, 2010; White & DeGenero, 2016; Goggin & Goggin, 2016).

In spite of the established presence and importance of such encounters reported in the literature, very few studies on this phenomenon have suggested this feature of development could or should be explicitly taught as part of curriculum, training, or professional socialization strategies (with two notable exceptions discussed in the final sections of this paper). We argue that this could and should

be done. To do this, we first briefly review the literature on the mechanisms of enculturation and apprenticeship found in academic settings to understand what research has revealed about how academic careers are thought to be taught and learned. This is followed by a more extensive discussion of theories which set out to explain chance, serendipity, fortuitous events in career development.

THE MECHANISMS OF ENCULTURATION AND APPRENTICESHIP IN ACADEMIC SETTINGS

Charles Bazerman (2006, p. 223) describes enculturation and apprenticeship in academic settings as the “result of substantial [education] that makes these odd and particular forms of communication familiar, meaningful and intelligible in detail and nuance.” This applies not only to forms of communication but to “the kinds of roles and stances one adopts, interpretive procedures, forms of contention, and uses to be made of the texts” (Bazerman, 2006, p. 223). For example, and in the case of our particular context, multilingual scientists have to communicate findings, discuss, and exchange the latest research developments in their specialties. To successfully carry this out, they need fluency in the full spectrum of knowledge and skills intrinsic to their particular specialties. In addition, they need to have written and spoken fluency not only in English, but the scientific English of their specialty which they can only fully acquire in immersive situations in their specialty (Bazerman et al., 2012).

Carrasco et al. (2012), in their study of students in Mexican doctoral programs, develop a theoretical framework for illuminating the kind of language learning Bazerman defined above. Relying on a number of frameworks, they see literacy academic development in both Spanish and English as situated, social, constructed, specifically dependent on context, and negotiated—learned through interaction, and requiring emotional engagement of everyone involved. This intense constructed learning leads to transformation from neophyte, to novice, then apprentice and ending as the target goal—*independent researchers* (Carrasco et al., 2012). During this trajectory or experience of a potential scientist intent on becoming a researcher in laboratory sciences, students acquire the role of author, reader, critic, editor, and local expert, by gradually participating in research processes and committees and review panels among other activities in their specialty (Carrasco et al., 2020).

Specific content knowledge of the discipline is, of course, explicitly taught. However, many language skills and practices leading to becoming independent researchers are not explicitly taught or learned. They are, for the most part, taken in via practice described as the “*apprenticeship mechanism*” which operates through the socio-cultural milieu of the learning environment. As Carrasco et

al. (2012) explain, citing Delamont & Atkinson (2001, p. 100), this learning is “*caught* rather than *taught*, transmitted through personal experience rather than by systematic instruction. . . . It travels best where there is personal contact with an accomplished practitioner and where it is already tried and tested.”

Thus, academic literacy development is believed to be implicit and constructed upon tacit insider knowledge (viz., Bazerman et al., 2012; Carrasco et al., 2012; Carrasco et al., 2020). In other words, this knowledge is passed on to learners *through* the social interactions carried out in the various contexts associated with the particular discipline.

Reflecting back on the first part of the paper, we bring back the notion that literacy in academic careers also develops from chance encounters happening within those same disciplinary contexts (and associated contexts). Whether someone benefits from those encounters is seen as an amalgam of a number of features. The question we raise at this point is: considering the clear importance and influence of chance, could those features be made explicit in career learning? And if so, what might that explicit knowledge and instruction look like? To answer those questions, we need to attempt to uncover the features and understand why some people are able to benefit from chance and, by inference then, why others do not.

THEORIES OF CHANCE ENCOUNTERS, FORTUITOUS EVENTS, SERENDIPITY IN ACADEMIC LITERACY AND CAREER DEVELOPMENT

The literature on this topic agrees—“chance plays an important role in everyone’s career” (Mitchell et al., 1999, p. 116). Although it might seem like it at first glance and in spite of the common definition of chance, events of this nature do not happen from pure random chance. Certain elements, dispositions, interests, motivations were in place to enable the event. For a chance encounter to have an effect, a person needs to have at least some personal attributes (e.g., personality, cognitive, and affective factors). These need to express themselves in the target career/professional environments and will contribute to the likelihood and intensity of chance encounters within those environments. The factors are presented in the following section and summarized in Table 2.1.

FACILITATING THE LIKELIHOOD AND OVERALL EFFECTS OF CHANCE ENCOUNTERS

We all operate under a set of self-conceptions that form “prototypes” or “cognitive schemata” that are used as frames for our interpretations of the world. These interpretative frames also affect our behavioral choices and outcome evaluations

which thus act as reinforcements to self-conceptions (Cabral & Salomone, 1990, p. 12). People who have established beliefs in their ability to cope with and take advantage of change are more likely to recognize and use chance encounters to change life path trajectories.

Emotional ties contribute to life changing effects of chance encounters. People will form lasting relationships if they like each other. Clearly, if a person finds qualities of others in an area disagreeable or if the person is deemed unlikeable by others in the milieu, lasting bonds are unlikely to be formed thus reducing the chances of life path changing effects from that particular association. This reinforces the notion of knowing oneself, being aware of personal standards and values, and being able to determine if those or compatible constructs are shared (Guindon & Hanna, 2002).

To these general characteristics White and DeGenaro (2016) offer some specific personal factors which they see as facilitating life changing events from chance encounters. The one that seems to particularly stand out is a willingness to engage in social interaction—to make “small talk” and have discipline related conversations, to have a willingness to make plans for collaboration, to take advantage of events like sharing a ride with a colleague or mentor and engaging in conversations about seemingly mundane matters such as hobbies—which can lead to discoveries of shared interests and values. Those kinds of interactions, if the interlocutors are willing, can lead to further and ongoing social occasions such as weekly social gatherings of likeminded peers and mentors. Even carpooling was regarded as an opportunity for collaboration and development—as a result of serendipitous meeting between scholars in similar disciplines.

To the factors presented thus far, Cabral and Salomone (1990, p. 10) add two personality factors, “locus of control” and “self-concept,” to the explanation of the overall impact a chance event will have on life/career path direction. Locus of control has to do with an individual’s conception of where the control in her or his life lies, more externally or more internally. Individuals who have a more external, deterministic conception of control are less likely to be “proactive” when chance encounters present themselves (Cabral & Salomone, 1990, p. 12). These features also appear in notions of agency (e.g., Bandura, 1989; Emirbayer & Mische, 1998).

To this framework, Wiseman (2003) adds affective factors such as the ability to control anxiety and, in a related vein, those who can control negative emotions by their use of counterfactual thinking. His studies related to chance, luck, and superstitions indicated that people who were generally more tense and anxious were less likely to notice an unexpected event. The heightened emotions caused participants in one of his reported studies to miss details and opportunities than less anxious people. Another feature of people who generally were

able to recognize and benefit from fortuitous events was the tendency to use counterfactual thinking. Wiseman defines this as the ability to see barriers and setbacks not as problems and disasters, but as seeing these events as “not as bad as they seem,” “to make the best of a bad situation”—to “soften the impact of the ill-fortune” (2003, p. 4).

Similarly, Rice (2014) cites a (rather small, $n=17$) study looking at professional careers of women which identified personal and environmental categories of factors which were seen to influence the overall strength of a chance event relative to the effect on career development. The personal class determinants consisted of “willingness to be flexible and take risks, competence, hard work, motivation, optimism, and being alert to opportunities” (p. 449). The environmental determinants identified were “maintaining a strong support system, [participation in] personal and cultural events . . . [and] freedom from external barriers such as being single or having few responsibilities” (p. 449).

As has already been implied in the above discussion generally focused on personal characteristics, the environment is also seen to play a role in the influence a chance encounter will have on life change. In fact, personal and social/environmental factors are tightly intertwined and are seen to work synergistically. The social/environmental factors identified in the literature work with the personal factors to further imbed the individual within the environments likely to promote academic success and provide opportunities for advantageous chance events.

Generally speaking, if the environment possesses desirable features, an individual is more likely to seek out membership in that environment. That will tend to increase the number and quality of chance events associated with it. So, if the environmental milieu rewards individuals sufficiently, they will be more likely to remain in the particular environment and be changed by the association. Likewise, the symbolic systems employed within the environment will also work to strengthen membership (and therefore lasting life path changes) of the members. Similarly, the “openness” or “closedness” of a milieu will determine the amount of life path effect on the individual. More open milieus will permit members contact with other environments and ideologies thus affecting life path trajectories. The more closed a milieu is the more direct affect it will have on the individual member and the ideologies they form (which further tend to influence life paths). Psychological closedness of the group members increases the overall strength of the group in turn increasing the likelihood of the long-term existence of the group. Generally speaking, the longer the time span, the more opportunities for chance and change (Bandura, 1982).

Thus, certain factors are seen to mediate the effects of chance encounters on life paths. To summarize, those factors fall within two larger reciprocal categories of personal and environmental factors. Personal characteristics mentioned

are a cohort of personal attributes which work to maintain continued contact with an environment, along with emotional elements such as “likeability” and possession of shared values and behaviors. Environmental factors are more compelling if they provide a sufficient level of rewards, symbolic systems, if there is a psychological closeness between the members—shared interests, abilities, and beliefs, and whether the environments are more open or more closed (summarized in Table 2.1).

We see these and similar determinants in most of the literature we reviewed on this topic (summarized in Table 2.1). In the following sections we show what these determinants look like in our sample of data collected from mid to late career academic professionals working in a university setting (explained in detail further on).

METHODS

In order to complete the aims set out in the beginning of the paper, we seek examples of instances of chance reported by those who have been successful in their careers. Since chance is recognized as an element in everyone’s career (e.g., Mitchell et al., 1999), we should find instances of it in our data related to career development. We draw the data from our studies carried out over a decade of research with a population of academics and researchers whose first language is Spanish, but who must write and publish their research in English. Our work with this group generated a rich collection of data associated with their development, practice, and psychological dispositions (explained in detail further on).

PARTICIPANTS – SUCCESSFUL RESEARCHERS WRITING AND PUBLISHING IN ENGLISH

The well documented literature on science writers with native languages other than English highlights the challenges these writers face in their professional development. They not only need to achieve worldwide levels in their discipline knowledge, but they also have to communicate globally in the current language of science and technology, English (Bazerman et al., 2012). Yet in spite of these daunting challenges, many are able to participate and significantly contribute at the highest global levels. We feel these features make an interesting group to study and provide ample instances of how chance was seen to operate in their development as high level researchers and writers. To do this, we mined through our volumes of data and pulled out the instances of chance. With those we overlay the theories of career learning and chance and serendipitous events to help us make sense of the phenomena and then use these as “heuristics for action” (Bazerman, 1992, p. 103) as we propose in the final sections.

The research site was a large research university in central Mexico with a very high research rating in particle and nuclear physics, mathematical physics, and quantum and theoretical physics. Our participants, mid-career and late-career, were chosen because of their high levels of recognized academic output. They came from a number of specialties in physics, mathematics, medicine, economics, and psychology and also from a variety of national and linguistic backgrounds although most were native speakers of Spanish. In our various studies involving these participants, we used a variety of qualitative and quantitative data collection and interpretation methods. However, for the purposes of this paper, we will draw our data from the narrative interviews. From the larger group, we have selected to present the cases of four career successful researchers (defined as successful based on their affiliation in the *Sociedad Nacional de Investigadores*).

INTERVIEWS

The narrative interviews we chose for this followed the protocol found in Lieblich et al. (1998). The interviews, carried out individually, required only a standard sheet of paper for each participant which was divided into two numbered columns starting with zero and ending in most instances around 60, approximately 30 numbers per column, representing years of life. The interviewees were asked to fill in information related to anything that seemed important to them in any order they chose. They talked about the periods of their lives, important people, their personalities, and reactions to events as they filled out the years. Questions were asked only for the purposes of following up in more detail certain comments and to encourage them to think about their lives and experiences as those events related to their personal and career development. Analysis categories, codes, and procedures were developed after the interviews to ensure that no leading or biased questions would be asked or that the participants would be inadvertently led in any response direction.

The length of the interviews ranged from one to two hours or longer. Most of the interviews were conducted in Spanish. All of the interviews were digitally recorded and life story year sheets were kept as interview records. Permission was granted from each participant to record the interviews and all participants were assured of the anonymity and confidentiality of the interview data. All of the participants seemed to enjoy the interview experience, and a few recommended other colleagues as possible interview participants.

EXPLORATION OF THE DATA

Table 2.1 summarizes most of the characteristics identified in the literature reviewed above on chance which seem to influence the overall effect of such

encounters or events. These qualities or characteristics are seen to work as a cohort rather than in isolation. The degree to which they are possessed or are perceived by a person tends to correlate positively with the level of intensity of personal change resulting from the chance encounter—i.e., whether the encounter changes their lives, has only a slight effect, or no effect.

Table 2.1. Personal and Social/Environmental Factors Associated with Overall Effects of Chance Encounters, Fortuitous Events, and Serendipity in Career Development

	Personal factors		Social/Environmental factors
1	Entry skills – substantial knowledge, experience, competencies	A	Milieu rewards – group benefits: actual and intangible
2	Emotional ties – liking the people met, or gaining other satisfactions from them	B	Symbolic environment and information management – what the environment looks like to the outside world. Does it invoke awe and reverence or hatred and disgust
3	Values and personal standards – possessing similar standards and worldviews	C	Milieu reach and closedness
4	Personal levels of self-conceptions & efficacy beliefs	D	Psychological closedness – belief strengthening ability of a group
5	Self-regulatory capabilities	E	Creates the possibly of a desired future
6	Beliefs in personal agency and locus of control orientation	F	Other intrinsic qualities of the field which provide interest and motivation to participate
7	Emotional control – i.e., levels of anxiety		
8	Willingness to accept variety and change		
9	The use of ‘counterfactual thinking’ when dealing with failures and barriers		
10	Levels of general optimism		

* *The number and letter designations were used as an analysis coding scheme (Collected from inter alia: Bandura, 1982; Cabral & Salomone, 1990; Mitchell et al., 1999; Wiseman, 2003).*

CASE STUDIES

White and DeGenero (2016) provide the structural model for the case study portion of our paper. They use case studies of individuals reporting on their chance encounters and fortuitous events which led to career and discipline

changing moments. Below we present four cases in which we demonstrate what those events look like in our study population. We have used pseudonyms to identify the people participating in the interviews.

A number of interesting chance events directly supporting career paths were reported by the participants. Most of the interviewees identified these kinds of fortuitous encounters and events in the career development stage of their lives. This is probably due to the overall nature of the interview protocol which principally aimed to understand their literacy and career development as scientists, researchers, and research writers.

Jean Luc – Astrophysics, High Energy Phenomena, and Fundamental Physics

One of the clearest examples of a life changing chance event was reported by Jean Luc. The first thing he wrote on his interview form was regarding a school trip to the astronomical observatory near his school at the age of 12. He said that seeing the moons of Jupiter and the rings of Saturn through the observatory telescope set him permanently and single-mindedly on his chosen career course. “*Me incline por dedicarme esto de la astronomía y ya todo lo demás es consecuencia de eso*” [From this experience, I dedicated myself to astronomy and everything else after that is a result of this (observatory visit)].

However, it could be argued that sooner or later, there might have been other opportunities/incidents which his personality and abilities would have interacted with to result in a similar turn of events. From this point of view, chance might not seem to be as life-changing as it might appear at first sight, and single chance events are usually not evocative of change in themselves (Bright et al., 2009). In other words, besides the chance event(s), there are other predispositions and/or situations that will lead the individual to recognize and accept or reject the influence of the chance event.

Literacy development especially reading emerges as one of those cohorts of behaviors that made the interviewees particularly receptive to significant change from chance events. Jean Luc credited his love of reading to being punished as a child in primary school. He reported that he was not very sociable as a child which caused him to be punished for things he did to other children. Most of his punishment involved not being permitted to go to recess with the other children and having to stay inside and read or do some kind of schoolwork. He directly credited this punishment to his academic development that soon progressed beyond the level of his peers, an increase in his vocabulary, and his enduring love of reading. He said that the more he read, the more he wanted to read.

This literacy acceleration beyond that of his peers happened before the telescope event. We can see the strengthening of his academic self-efficacy beliefs, his beliefs in personal agency and locus of control orientations. Counter-factual

thinking is also evident in that he came to regard his punishment as quite beneficial to his development and as a reinforcement or something that strengthened his self-conceptions (e.g., surpassing literacy levels of his peers). We can also assume a certain academic affinity with others in the astronomy milieu which would give him access to the rewards and benefits of acceptance into that environment.

Pavel – Social Sciences and Economics – Work, Knowledge and Development in Latin America

Pavel provides another example of the benefits from literacy development opening doors to life changing chance opportunities. He was from an extreme poverty background, from a very dangerous part of Mexico City. There were very few, if any, opportunities for children from these sorts of neighborhoods. According to Pavel, many of the schoolteachers treated all the children as already lost and basically not worthy of any effort. This attitude was one reason why Pavel said he had absolutely no academic interests and had no intention of going past the primary level. However, at the age of 10, his 16-year-old brother was murdered in the street. This unplanned and tragic event made him reassess his educational intentions.

In addition to growing up in a deadly impoverished environment, Pavel was one of the two participants who indicated physiological judgments related to somatic characteristics which, in his case contributed directly to his academic development. He reported that when he was young, he was very thin and weak. While he initially indicated no academic interest, he was at the same time assessing his physical abilities to survive, since the question of survival had now become a personal issue. He realized physically he could not survive, so he decided he should rely more on his cognitive abilities.

As a means of coping with their environments, many of the participants indicated strategies they employed that helped insulate themselves from the dangers in their surroundings. Reading created an escape, but also an unintended increase in literacy skills. As one of the strategies he engaged related to basic survival, Pavel tended to stay indoors reading, avoiding interaction with dangerous elements in his area. Complete isolation was of course not possible. Another strategy was to control or appease some of the more violent and dangerous adolescents by doing their school assignments for them. This also had the unintended effect of strengthening his academic efficacy beliefs while at the same time guaranteeing his importance in his immediate social milieu. He credited this interest in reading anything he could get his hands on as another factor contributing to his positive efficacy assessments regarding his academic abilities. He said he began to notice he knew more than his peers and that it was a result of his reading habits (and extra assignments).

We can see here another instance of chance events associated with literacy events. Like the others, as Pavel's self-conceptions and efficacy beliefs strengthened associated with his academic abilities, his access to environments which held more potential positive career enhancing events increased (e.g., higher education). We can also see the effects of an early environmental milieu which did not offer what he thought it should. This led to his engaging alternative strategies—demonstrating a willingness to change and to seek out other solutions. This is associated with his beliefs in personal agency and locus of control orientations, and counterfactual thinking.

Jonathan – Neuropsychology, Neuropsychological rehabilitation, Child neuropsychology

Jonathan said that before having a particular primary school teacher, he had no interest in school and had planned to quit after the primary level. In the fifth level of primary school, he had a teacher who inspired his love of academics. He said that up to that point he had no interest in school or studying and basically only did it because he was supposed to. This teacher was the first to pay any attention to the students. Jonathan said before that because of the backgrounds of the students (*de recursos muy bajos* [very disadvantaged]) many previous teachers had treated them as if they were all delinquents (echoing Pavel's opinion). Jonathan reported that for the first time, he had a high level of interaction with a teacher and it was apparent this teacher really cared about the learning outcomes of the students. He identified this teacher as a pivotal person in his life whom he very much identified himself with.

Jonathan talked about a group he formed of like-minded students during his university years which was fundamental in his development as a researcher. He had to quit his university studies because of the economic crisis of the 1980s. He started peddling clothing from house to house. He said that this barrier did not derail his goal of university study. He saw it as something he just had to get through and that eventually he would back on track. He credited that attitude to a high level of coping efficacy. Jonathan actually saw this job as a positive factor in his life. He enjoyed it because he came to know many people and he made enough money to support his family. When he finally returned to his undergraduate studies, he was in his 30s. Because of his age, he was put in the "*vespertino*" [afternoon] group with the other older students who were there because they generally worked in the mornings and then went to the university at night. Younger students were generally put in the "*matutino*" [morning] classes. So, he said it was very "good luck" he was put with the more mature students because they were very much interested in their studies and were very competitive in a way that they inspired each other to study and to really get involved in their

education. Eventually with some of these classmates he formed a group dedicated to their field of study. The group produced publications, held seminars; they contacted researchers in their field, and were involved in curriculum changes in their own programs of study. The group, with varying numbers of members, was active all through his university and post-graduate years and was still active at the time of the interviews.

In Jonathan's case we see many of the dispositions identified in the literature. Several are particularly notable—his willingness to accept change, engaging in counter-factual thinking, and clearly a certain level of innate optimism. We can also see evidence of the effects of a variety of milieu rewards evident in his penchant for forming groups which led directly to a variety of chance events and other benefits from group membership. Almost all of the social/environmental factors are exemplified in his case.

Malcolm – Applied Optical Physics

Malcolm's established career is a product of the changes and vicissitudes of development articulated in Krumboltz (2009). Defining his career path took him a number of years. He first studied to become a Catholic priest. He then tried studying medicine in a military medical school. While preparing for the entrance exam, he realized he did not like biology or chemistry but was very interested in mathematics. So, he thought about studying a program in engineering in one or the other of the two most important engineering schools in Mexico City, but he had to revalidate his papers, which in Mexico implies a significant amount of time and trouble, and then present the specific entrance exam for the engineering program. All this would take about a year. So, his high school math teacher suggested he could register in the physics and mathematics department in his state university and then present the entrance exam for the other universities. He followed that advice. During that first semester he decided to stay in the field of physics. While he studied physics he worked as a janitor in the university in a place with an antique telescope. Intrigued and fascinated by that telescope, it was then that he decided to specialize in optics.

After 10 years of hard work, his team participated in an international project (more than 20 countries) on cosmic rays and they were invited to work with optic design. Malcolm's team designed the telescopes that were used to photograph a geographical zone with cosmic rays mainly because of their previous experience. Their telescopes later became crucial for the project and the team became very well known among the specialists in this field. As the head of the team, Malcolm received a number of invitations to meetings and conferences in other countries which were generally in English, of which he had almost no knowledge. Despite that apparent barrier, he used various compensating

strategies centered around reliance on other group members. After almost seven years, one of Malcolm's papers, published in English, on laser waves started to be read and cited. He regarded that point as the final confirmation that he had finally achieved his career development goal.

We can see several instances of life changing chance in Malcolm's case. Besides his apparent willingness to accept change in his long search for the right career, we see evidence of environmental chance events that influenced his choices. He possibly initially viewed these as barriers, but in retrospect these were chance events which led to finding his true career passion—optics. We also see the element of chance in the advice of the teacher suggesting entering the undergraduate program in physics and mathematics. That chance factor is reinforced by his working as a janitor and coming in contact with the antique telescope which fired his imagination. And we can see examples of milieu rewards and psychological closedness of the group—their mutual belief strengthening and cooperation related to their group work and achievements.

CAN CHANCE BE RECOGNIZED, GENERATED, AND/OR INCORPORATED INTO ACADEMIC LITERACY DEVELOPMENT?

To some extent the case studies above seem to show that chance encounters with literacy and career changing events happened mainly in early academic and career path developmental stages. This would have been at a point where their younger selves did not recognize the importance of chance but were, in a way, deterministically in line for such events to happen. What about those who are beginning their careers without the benefit of those serendipitous events? Or what of those who have not had the opportunity to recognize the importance of chance in development? Or even those who have not, for example, developed similar coping strategies and resiliency demonstrated in the case studies? As discussed above, this is something that is often left unacknowledged in professional development settings. We feel this apparent gap provides a *prima facie* basis for suggesting interventions aimed at remedying this omission.

Nevertheless, the accepted definition of chance, seems that to suggest an explicit pedagogical approach in academic literacy preparation, acculturation or apprenticeship is to deny the accepted nature of such events—i.e., what happens completely accidentally and without planning cannot be taught. However, looking closely at the case studies highlighting chance together with the associated theories and studies we can begin to see that these events were not completely a result of pure random happenstance, chance, serendipity—or whatever we want to call it. Personal and environmental factors came together as a result of a

connected string of dispositions, choices and events to create positive conditions for life changing events to happen. This opens the door to the possibility of explicitly preparing novices or incipient researchers and academics to increasing their receptivity to such events by helping them recognize personal dispositions and environmental/social situations that could produce positive and potentially life changing events.

Of the theories reviewed, only Krumboltz's Happenstance Learning Theory (2009), which is based on his earlier theory of Planned Happenstance, seems to offer any specific pedagogical strategies (Mitchell et al., 1999). The only other concrete framework for explicitly preparing people to recognize and seek out chance events we came across was in Wiseman (2003) with his description of his research-based "Luck School." Chance encounters, often associated with luck, was part of his analyses.

From our research and experiences with the Latin American scientists, we suggest a few features and strategies which might also be considered. The scientists we worked with reported being deeply engaged in their scientific fields and participating in "self-reinforcing and self-nourishing networks" (Keranen et al., 2012, p. 249). The recognition of the need to belong to their international communities was a central reported component of their success. Their immersion in these communities is both actual and virtual. It should be clear at this point in the discussion that immersion in the target environments is essential to exposure to positive chance events.

In terms of the scientists' ability to successfully write in English and publish their work in high level journals, which is another reported essential feature of their careers, they found through their experiences that English language courses are limited in what they can accomplish. They often lack the ability to address each individual's actual practice in the writers' specific contexts. We learned that no general English course nor even a specialized one in scientific writing which uses authentic materials can provide enough depth in the language of their specialty or the hours required to develop fluency. Further writing practice and development must happen in context specific immersive environments (Bazerman et al., 2012). Again, we see the apparent importance of immersion into target environments.

There are diverse opportunities for these intense language experiences, even when participants are not in a face-to-face English environment. Digital communications have been increasingly used and could provide an immersive

experience for these researchers interested in increasing their participation in their specialty. Facilitating supports, i.e., providing opportunities and raising awareness of the relevance of such opportunities, can be an important part of enabling researchers to understand the dynamics of participating and publishing in their specialty at a distance. These would be especially important for those who are still in the periphery of their specialty and have not yet acquired the communication skills and awareness to make connections and participate actively in the networks of their specialty. As Bazerman et al. observe:

Situated practice in significant, immersive, accountable, and consequential activities leads to motivated problem solving and habituated use that advances fluency and accuracy. Thus, as language professionals, we ought to consider providing the means to engage in more regular and more intense language experiences, which will be rewarding, reinforcing, and part of a trajectory of deeper engagement. (2012, p. 247)

On the personal level, we suggest some specific approaches. The personal dispositions illuminated in the case studies and summarized in Table 2.1 suggest certain psychological approaches. Those would certainly involve strategies of literacy competence reinforcing, strengthening concepts of personal agency, identifying role models, and building coping efficacy. The evidence-based strategies found in Krumboltz (2009) and Wiseman (2004) provide specific strategies for carrying out these possible approaches.

We also suggest the utility of case studies (such as those presented in this paper) in academic literacy and career development. Such experiences can help scientists in the periphery connect the dots of chance occurrences through the development phases of a career to make a complete story of academic literacy development in their specialty. We see these as particularly useful if the students or novice researchers collected, analyzed, and presented the case studies themselves from experienced and successful academics. These studies could identify potential role models and also make chance enhancing connections in the target environments.

In spite of these discoveries and possible intervention strategies, at the core of the successful scientists is that *need* to fully participate. As one participant explained:

- La diferencia eso es, lo mejor es un poco romántica pero yo creo que el secreto de una carrera exitosa digamos el plan de vida exitoso en el sentido de satisfecho y frustrado o insatisfecho es esa introspección, yo que quiero y ya al saber veo como es lo que quiero, en el caso este digamos de la investigación científica es yo quiero saber algo, no sé en

algún área del conocimiento humano y luego ya la otra es una cosa de consecuencia de la otra, pero es primero identificar si tengo esa sed de conocimiento esa necesidad de estar averiguando cosa, pues ya está la mayor parte de la carrera ganada.

- The difference is, perhaps this is a little romantic, but I believe the secret to a successful career, or a successful life in the sense of whether it is satisfying or frustrating or unsatisfying is this introspection. What I want and knowing what I want. Scientific investigation is “I want to know something.” I don’t know what area of human knowledge this is or what is a consequence of what, but first is to identify if you have this thirst to know things, this necessity to find things out, but then the major part of the career is won/achieved.

For those who have that inner drive interventions, strategies, instruction, immersive situations, and opportunities will place them in strategic locations for chance events to have lasting and positive effects on their literacy and career development.

FINAL THOUGHTS

As we learned from the histories and attitudes of the scientists who manage to publish regularly in English, chance events flourish into life and career path changing events. Considering the ubiquity and potential life changing benefits of such encounters documented in the literature and exemplified in the case studies, we propose that explicit strategies should be used to help novice academics/researchers recognize and understand the importance of chance encounters in their professional development. To support this assertion, we cast our argument within the larger theoretical models associated with chance encounters and serendipity in career development (inter alia, Bandura, 1982; 1989; Bright et al., 2009; Goggin & Goggin, 2018; Kindsiko & Baruch, 2019; Krumboltz, 2006) and the mechanisms of enculturation and apprenticeship in academic settings (e.g., Bazerman, 2006; Bazerman et al., 2012; Carrasco et al., 2012; 2020; Keranen et al., 2012). By examining instances of reported chance found in our case studies, we can see how the theories are actualized in the data. We can also see that what may initially appear as unplanned and happenstance is really a cohort of personal dispositions, environmental milieus, and events which can be retrospectively traced in career trajectories. As such these elements can be identified and made explicit with the aim of helping incipient academics and researchers increase their personal agency in seeking out and benefiting from chance events and encounters. How such instruction plays out in specific settings and

academic disciplines is dependent on context and the imagination and creativity of leaders and instructors.

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