

Institutionalizing People:
Professional Identity Development of Postdoctoral Scientists

Sonya Sunyoung Pyo, BA

M.Sc. in Management Program

Submitted in partial fulfillment
of the requirements for the degree of

Master of Science in Management – Organization Studies

Goodman School of Business, Brock University
St. Catharines, Ontario

© 2018

Abstract

Professional identity development has been traditionally studied from a cognitive and discursive perspective that has overlooked how emotional, fragile and unstable identification can potentially be. Building on recent theorizations on emotions and ethos, the institution's highest ideals, that enrich our understanding of professional identity, I explore the interlevel mechanisms of ongoing management of professional identification in this qualitative study on postdoctoral scientists. Postdocs represent the "in-between" professional, having completed their education but not yet independent scientists, who are continuously revising, expanding and negotiating their identity. Results show that while ethos becomes deeply embedded in identity, it also becomes decoupled from experience. Postdocs manage ongoing identification by resolving this tension between ideals and experience, however, failure to resolve such tensions can lead to disillusionment and exit. This work contributes to the literature by centralizing professional identity around values and emotions and also theorizes on the role of significant others for professional identity and the synergy between the institutions of family and profession.

Keywords: professional identity; postdoctoral scientists; scientific ethos; institutional actor; professions; emotions

Acknowledgments

I would like to express my deepest gratitude to my supervisor and mentor, Dr. Maxim Voronov, who has opened up a world of opportunities in the field of Management for me. His encouragement has helped my self-confidence as a researcher, and his patience and understanding of my personal circumstances have allowed me to reach my highest potential. He has been genuinely engaged throughout my learning process, and for that his reflections, guidance, insights and constructive criticisms have been crucial in my growth as a researcher. I will always be grateful for how he has advocated for me, and for selflessly giving his time and effort for the sake of my success. It has been an honor training as his student.

I would also like to thank Dr. Trish Ruebottom for serving as my thesis committee. As her research assistant, I've not only deepened my research skills through her mentorship but have genuinely enjoyed our stimulating and even invigorating discussions that constitute co-authorship. I have always appreciated the kind and laid-back manners through which she delivers her razor-sharp insights and I have never been treated with more respect and equality than in her presence. Her comments have helped improved my work considerably and for that I am grateful.

I owe my gratitude to Dr. Tek Thongpapanl whose feedback has challenged me to dig deeper into my data. He has been generous with his advice on navigating career in research and pushes his students not only in terms of research, but also ethical responsibilities, work-life balance and many other aspects that make life as a researcher whole.

Last but not least, I'd like to thank my external examiner, Dr. Bob Hinings for his time and effort despite personal circumstances. The depth of his questions, comments and insights and his attention to details shows his genuine effort to continue improving my method and work, and I thank him for a thought-provoking and memorable defense.

Table of Contents

1	Introduction.....	1
2	Literature Review.....	4
	2.1 Professional Identity	5
	2.2 Theoretical gaps in professional identity	8
	2.3 Institutional theory and actorhood	11
	2.4 Emotions as an antecedent to desire	13
	2.5 Institutional ethos as morality.....	15
3.	Methods.....	19
	3.1 Research context and setting.....	19
	3.2 Data Collection	21
	3.3 Analysis.....	23
4	Findings.....	27
	4.1 Scientific ethos at the institutional level	27
	4.2 Individual level internalization	29
	4.3 Externalization of Ethos.....	41
	4.4 Ethos validation by significant others.....	46
5	A model of professional identity construction as a dialectic of institutional ethos and subjectivity	50
6	Discussion.....	53
	6.1 Maintaining ongoing identification.....	54
	6.2 Ethos-values-morality and identity	58
	6.3 The Role of Significant Others	59

6.4 Limitations	62
7 Conclusion	62
References.....	64
Appendix A: Interview Protocol.....	69

List of Figures

Figure 1: Overview of Data Structure.....	26
Figure 2. Process Model of Professional Identity Construction.....	51

List of Tables

Table 1a: Demographic Table of Postdoc Interviewees.....	21
Table 1b: Demographic Table of Significant Other Interviewees.....	22
Table 2: Scientific Ethos – Secondary Data.....	28
Table 3: Internalization of Ethos.....	39
Table 4: Externalization of Ethos.....	45
Table 5: Impact of Family and Significant Other’s on Postdoc’s Career.....	47
Table 6: Roles of Significant Others.....	49

1 Introduction

For a generation that holds work more central to their lives, where one's professional identity more often than not takes precedence over social, national, or religious identity, what we do as professionals defines much of who we are. Work becomes more than a means to an end, but rather the very source of meaning and identity. For some, professional identity is central in the sense that it permeates all areas of life. The values and sense of higher purpose originating from the institutional order inspire passionate identification with the institution of the profession.

How a profession can be a calling naturally falls within the domain of the professional identity literature that studies the sense of self attached to a professional role (Chreim, Williams, & Hinings, 2007; Kyratsis & Phillips, 2017; Pratt, Rockmann, & Kaufmann, 2013; Reay, Goodrick, Waldorff, & Casebeer, 2017; Yu, Kim, & Restubog, 2015). How professional identity connects the person to the higher institutional ideals, however, belongs more to the realm of institutional theory and the concept of institutional actorhood (Glynn, 2017; Meyer, 2010; Scott, 2008b). Such interlevel interaction that produces such passionate identification to the institution however has been conspicuously overlooked perhaps due to the sparsity of cross-fertilization between the two streams of literature. At the same time, both professional identity and institutional literature have focused more on the cognitive, behavioral and discursive identification rather than the affective that speaks more directly to passion and meaningfulness. This could be partially due to the in-role identity perspective that has dominated the identity literature where certain identities only become salient according to the surrounding social circumstances. In order to compartmentalize identity, scholars have tended to look at behavior,

cognitive processes and language that are more suited for demarcation, as opposed to emotions and affect that by nature defy such compartmentalization.

In this current study, I take advantage of the opportunity to intersect professional identity theory with institutional theory to illuminate the multilevel mechanism of how people not only identify with, but commit to, and become emotionally attached to their profession, by simultaneously utilizing the emotional lens and expanding the in-role identity to one that is potentially all-encompassing. Despite the mentioned gaps, there is much to draw from the professional identity literature that has built a rich and nuanced micro-level theory on individuals' identities construction, reconstruction and maintenance. Similarly, institutional theory has long considered professions to be a powerful influence on society and in key institutional processes (Muzio, Brock, & Suddaby, 2013; Scott, 2008a; Suddaby & Viale, 2011), though it has only recently begun taking people seriously as its own level of analysis (Anteby, Chan, & DiBenigno, 2015; Powell & Rerup, 2016).

There have been some recent developments in institutional theory concerning emotions and ethos, which is the institution's highest ideals, that has significantly contributed to fleshing out who the institutional actor is as a person. Just as these new developments have inspired many new studies on institutional actors, there is a clear potential for the theories on emotions from an institutional perspective to contribute to and expand professional identity theory. After all, professions are institutions and professionals, institutional actors. Emotions were brought into institutional theory to understand how people become emotionally invested in institutions through the ethos that disciplines people to care for the institution. Ethos draws emotional energy and animates an otherwise abstract institution into a lived and subjective experience (Voronov & Weber, 2016). Institutional actors enact and "inhabit" the institution, not because they are

unaware of other possible arrangements, but because they are emotionally invested and passionately desire the ethos of the institution. Since professional identity connects work to identity, and institutional actorhood connects person to the institution, combining the two yields the sort of multi-level study that institutional scholars having been calling for in the last decades.

To study the role of ethos and emotions in professional identity development, as well as the emotional investment that underpins institutional actorhood, I am conducting an inductive, qualitative research on a sample of postdoctoral scientists in both academic and national laboratory settings. Postdoctoral scientists are “in-between” professionals, because they are partially socialized and not yet not full-fledged professional scientists, but also because postdocs face much uncertainty about their future career as a scientist, both in terms of opportunity and their own commitment to the profession. Paying particular attention to emotions, I study how these postdocs manage their ongoing identification with their profession, which are at times fraught with challenges, and therefore fragile and highly unstable. Secondary data consisting of writings collected from prestigious scientific societies and journals provide evidence for professional ethos existing at the collective level. Results show how commitment to one’s profession grows as professional ethos is progressively internalized and externalized, however both internalization and externalization requires conscious reflection and purpose-driven action, with the real possibility of exiting the profession. Surprisingly, postdocs who choose to exit the scientific career path are equally committed to the scientific ethos compared to those who stay and are usually driven to their decision to exit because of their values.

The theoretical contribution of this work lies in explaining the ongoing struggle to maintain the fusion between the person and the profession which has been assumed to be automatic and linear in the professional identity literature. Within the professional identity

literature, the contribution of this study is in making values and emotions a central mechanism in professional identity development, while the concept of professional ethos brings in the institutional level that has usually been absent in the literature. Within institutional theory, this study further elaborates the micro-level processes that is necessary in taking people seriously as institutional actors. This study also contributes with the theorization on the role of significant others in professional identity development as well as institutional synergy between family and professional institutions.

The paper is organized in the following five sections. The first section will review existing literature on professional identity, institutional ethos and emotions, and the link between values and identity. The second section describe the methodological approach in this interview-based qualitative study. The third section presents the data sources, both primary (interviews) and secondary (texts from scientific journals and societies) and the data-structure to illustrate how the data were coded. The findings elaborate on the mechanisms of internalization and externalization of ethos as well as the role of significant others in the process. I then present a process model to connect the higher-order themes. The discussion explores implications of the results on our understanding of professional identity construction and institutional actorhood and how it hinges on ethos and emotions. I will then conclude arguing for greater attention paid to emotions as it connects with values, as well as the role of significant others in professional identity formation.

2 Literature Review

To set up the theoretical background of this study, I review the current literature on professional identity that has been conceptualized as a dialectical relationship between identity

and professional role. Studied at both the individual and collective level, professional identity though rich and nuanced in its diverse accounts, has only begun to address the overemphasis on the cognitive and discursive mechanisms of identity processes as well as the in-role identity perspective.

I then review current trends in institutional theory and describe how it can potentially enrich the professional identity literature. Though it suffers from the same general lack of emotionality, recent theorizations on emotions and ethos in institutional processes provides exciting avenues to expand our understanding of professional identity as passionate identification. I then theorize on the link between institutional ethos, morality, emotions and identity to setup the premise for this study.

2.1 Professional Identity

Professional identity is defined as one's self-understanding that arises from a professional role (Barley, 1989; Ibarra, 1999; Pratt et al., 2013). The professional identity literature has sought to understand the intimate connection between the self and the profession. People come to understand who they are in terms of their professions, its goals, values and norms (Abbott, 1988), and consequently, the sense of self as a professional is pivotal in the way professionals perform their role, interpret the meaning of their work, respond to and initiate changes in their environment. Role performance and identity influence one another in a dialectical relationship in which external enactment is internalized as identity, and identity is then expressed and maintained through external enactments (Berger & Luckmann, 1966; Endrissat, Karreman, & Noppeney, 2016). Some studies focus on the way role influences identity as internalization. Pratt, Kaufmann and Rockmann's (2006) research on medical residents showed how the distinct

nature of work in different sub-specialties lead to differentiated professional identities. Though the residents entered with partial and somewhat uniform identities due to similar medical education, the residency period was marked by identity customization work to match their self-understanding as a doctor with the specific nature of their work. Other studies have shown how doctors reconstruct or modify their professional identities in response to external changes in the institutional arrangement causing significant changes to the way they practiced medicine (Chreim et al., 2007; Kyratsis & Phillips, 2017; Reay et al., 2017). Other scholars explore the externalization aspect in which identity influences role performance. Wright, Zammuto & Liesch's (2017) study explore the way doctors perceive problems stemming from value conflicts and choose to respond in accordance with their identities. The doctors managed the conflicts in a way that aligned with the values of their profession, triggered by moral emotions arising from who they are as doctors.

Professional identity and role identity in general were originally theorized as firmly embedded within the larger social context and therefore inherently relational and interactional (Stryker & Burke, 2009). The profession defines how the professional relates to others and how it contrasts with other occupational members, along with the hierarchy and the social rules that govern these interactions. For example, Anteby's (2008) study found how craftsmen in an aeronautical plant distinguished themselves from unskilled workers and office employees, while they related with one another in a shared, collective identity. The craftsmen created elaborate artifacts showcasing their skills that were then exchanged with one another as gifts. Making and exchanging the artifacts fulfilled the need for identity enactments when a decline in demand led to fewer opportunities for such enactments.

Professional identity exists at both the personal and the collective level. The rich body of literature that focuses on the microprocesses of professional identity has revealed the various stages of socialization, maintenance and reconstruction from several different perspectives, whether cognitive, discursive, narrative, affective and even physical. Ibarra (1999) studied how early professionals in the course of socialization constantly revised their “self-conceptions and representations they hold about what attitudes and behaviors are expected in their new roles” (p. 765) by observing and emulating role models. The professionals were spurred on by a gap in their *cognitive* understanding of professional identity in which the “provisional selves” provided a temporary bridge. Alvesson & Wilmott (2002) explored the *discursive* lens where organizations managed identity through strategic discourse, inspiring their employees to align themselves with the “managerially designed and designated identities”. Other scholars have favored the *narrative* method, in which identity is made coherent and articulated in a storyline that connects the past to the present to future dreams (Fraher & Gabriel, 2014; Ibarra & Barbulescu, 2010; Thornborrow & Brown, 2009). Even the *physical* aspect was brought to attention by Michel (2011), who explored the use of invisible controls by organizations to control and discipline the bodies as well as the minds of employees. When bodies began to break down, employees were forced to reconcile the conflict between the body and the “socialized mind”, but then were able to regain levels of productivity and creativity when they let their “bod[ies] guide action”.

At the macro-level, scholars have looked at the way collective professional role identity was changed and legitimized to itself collectively, to incoming professionals, and to closely-related occupations and clients. For example, professional associations of accountants played an important role in hosting discussion and debates in order to reframe professional identity,

transitioning from highly-specific to multidisciplinary service providers, both to itself and to the outside world (Greenwood, Suddaby, & Hinings, 2002). In another study, professional role identity was defined and legitimized through nursing textbooks that connected the history of the occupation to the meaning of the role in today's health care system (Goodrick & Reay, 2010). A third study looked at how service designers constructed a new mandate by defining a professional ethos in order to achieve both internal coherence and external legitimacy as a nascent profession (Fayard, Stigliani, & Bechky, 2016). What these studies emphasize is that the interest of professional identity is not simply in the idiosyncrasies of individual experiences and self-understanding, but how it affords the individual a place within the shared framework of the collective community.

2.2 Theoretical gaps in professional identity

In the interest of studying professionals who exhibit high passion and commitment to their work to the extent that they place work as central in their lives, professional identity offers a rich theoretical basis that covers the dialectical, relational, interactional, micro and macro components. Several theoretical gaps, however, must be addressed.

In favor of the cognitive and discursive approaches, many studies have overlooked the emotional component of professional identity. As a consequence, people are painted as cognitive beings whose professional identity development is predictably linear and automatic. Medical residents for example sought to better align their identities to match the work content and work process (Pratt et al., 2013), and changes in these identities involved changing labels, description or categorization of their identities (i.e. surgeon to most complete doctor) to resolve the mismatch. Others utilize narrative analysis to understand how individuals make sense of their

identity through a narrative (Ashforth & Schinoff, 2016; Chen, McAlpine, & Amundsen, 2015; Fraher & Gabriel, 2014; Ibarra & Barbulescu, 2010; Thornborrow & Brown, 2009). While these narratives can certainly contain emotional content, it is not the emotions themselves that symbolize identity work, but the sensemaking mechanism of the narrative that aid people to describe and understand their identity. On the contrary, identification is often driven emotionally in ways that are sometimes unconscious and difficult to rationalize. For example, a study on Amway distributors have documented cases of failed and ambivalent identification to the organization based on positive and negative emotions that separated the “lovers” from the “haters” (Pratt, 2000). A study on liminality, which is the state of being between identities or social roles, conceptualizes this subjective experience as being marked by intense and at times ambivalent emotions (Ibarra & Obodaru, 2016). A greater focus on the emotional plane in the construction of professional identity would be needed in order to uncover a process that is fragile and unstable, yet potentially unwavering in its passion and commitment.

A second source of limitation comes from the in-role perspective that much of the literature follows (Stryker & Burke, 2009; Tajfel, 1974). The assumption is that the identity becomes salient when in-role, and that people have as many identities as they do roles. While proven fruitful in many studies, this perspective has led scholars to often limit their study of professional identity to what occurs at and only at work (Chreim et al., 2007; Reay et al., 2017; Thatcher & Zhu, 2006), only exceptions being those that explicitly investigate work-life balance (Dumas & Sanchez-Burks, 2015; Harrison & Wagner, 2016; Ramarajan & Reid, 2013; Rothbard, Phillips, & Dumas, 2005). For example, Thornborrow and Brown’s (2009) study on British paratroopers described how many members entered with strong aspirations formed as early as childhood, having been exposed to societal discourse that glorified the “extraordinary courage”

of military and paratroopers, and some having direct family connections to the Regiment. Non-work influences clearly contributed to the initial aspirations of the paratroopers, yet how they constructed their identity in accordance to the organizationally disciplined discourse focuses on experiences and relationships at work without revisiting these outside influences in these processes.

For those who live and breathe the work of their profession however, professional identity can remain salient even when not in-role, with the values and norms of the profession touching on other domains of life. These professionals also tend to rely on the support of significant others and family members, though this aspect is often rendered invisible in most studies. The multiple role perspective has also deflected attention away from the way one particular identity can play a central unifying role for a person's various roles (Ramarajan & Reid, 2013). Incorporating non-work roles, activities and general life, as well as social interactions outside of work, such as with significant others, might allow the researcher to capture just how widely encompassing professional identity can be.

Lastly, the macro and micro level studies of professional identity show acknowledgement of the two levels of analysis, however few studies delve into the interlevel dynamics from the individual to the institutional. One exception to this is Chreim et al.'s (2007) study on doctors' professional identity reconstruction and how it was both enabled and constrained by the changing institutional arrangement in health care. It cannot be assumed however that the dynamics of reconstruction applies to new professionals. While Chreim et al. studies professionals already committed to their profession and need to come to a new understanding of their identity, this study attempts to study how such a commitment occurs in the first place. Interlevel analysis has been the explicit goal for institutional theorists more than professional

identity, and in this way institutional perspectives might help synthesize the professional identity literature.

2.3 Institutional theory and actorhood

The theoretical gaps of professional identity provide an opportunity to bring in institutional theorizations on actorhood. Conceptualizing the professional as an institutional actor can lead to a deeper understanding of how professionals become emotionally attached and passionately committed to the institution of the profession.

The concept of the institutional actor has continuously evolved and become multi-dimensional over the past decades as institutional theory as a whole continued to mature. Neo-institutionalism first came about in response to the over-rationalized view of organizations that act simply to maximize their interest, and instead presented the view of organizations as bound by their institutional context and its rationalized myths (Greenwood, Oliver, Sahlin-Andersson, & Suddaby, 2008). Institutional actors, including organizations, groups and individuals, acted not necessarily rationally, but according to what was believed and taken-for-granted as rational (Meyer & Rowan, 1977). These actors, however, were seen as unreflectively reproducing, perpetuating and spreading the rationalized myths of the institution, and were thus labelled as “carriers” of institutions (Greenwood et al., 2008). Critics of this view preferred the term “cultural dopes”, referring to the way these actors were portrayed as overly socialized and utterly unaware of the institutional influence on their actions and beliefs. At this time, there were calls for research to look beyond isomorphism and conformity to begin accounting for institutional change and the possibility of agency of institutional actors in these change processes (DiMaggio, 1988). These actors would be granted a degree of reflexivity and creativity (Oliver, 1991) that

can potentially initiate institutional change (Seo & Creed, 2002), thus the “institutional entrepreneurs” (Battilana, Leca, & Boxenbaum, 2009; Hardy & Maguire, 2008).

Still, the two extremes of the cultural dope on one side and the “hyper-muscular” institutional entrepreneur on the other were unsatisfactory for the institutional community to engage in the conundrum of institutional change. Revolutionary changes and social movements led by champions were important phenomena, however scholars became increasingly aware that the bulk of institutional change occurred more gradually, more collectively, and cumulatively through daily, micro-level effort (Lawrence, Leca, & Zilber, 2013). Not only did the theory of institutional work offer a compelling interlevel mechanism of institutional change, but in this view, people mattered—how they behaved, conformed, resisted and responded to the changes had the potential to be part of a larger institutional dynamic. So the focus turned to “what should we do about people?” (Hallett & Ventresca, 2006). Scholars began paying closer attention to people utilizing the tools of ethnomethodology, discourse analysis and narrative approaches, examining people in the workplace, in action and interaction, scrutinizing their perceptions, values, problem-solving and decision-making processes all within the context of the institutional environment in which they were embedded (Bechky, 2011; Dunn & Jones, 2010; Glynn, 2000; Heinze & Weber, 2015; Pache & Santos, 2013). Institutions were “inhabited”, where codes were interpreted, enacted and modified through social interactions and activities laden with meaning and symbolism (Hallett & Ventresca, 2006).

Emotions was the latest development in the effort to elaborate on institutionally embedded people. Institutional theory had suffered from the same shortcomings as professional identity in being very much cognitively focused, looking only towards conscious understandings and language as evidence for institutional work. As Hallett and Ventresca (2006) argued,

however, inhabited institutions are lived and actualized through daily interactions, and emotions are a central part of lived experience (Voronov & Vince, 2012). Scholars are increasingly incorporating emotions into their research (Creed, DeJordy, & Lok, 2010; Ibarra & Obodaru, 2016; Toubiana & Zietsma, 2017; Wright, Zammuto, & Liesch, 2017). Voronov and Weber (2016) went on to theorize how people personally experience the institution by its ethos, the institution's fundamental ideals, through emotions that fuel their desire and attachment for the institution. The application of emotions and institutional ethos for professionals is clear, and perhaps the key to understanding the interlevel dynamics that construct the kind of professional identity that is marked with singular passion.

2.4 Emotions as an antecedent to desire

Since Voronov & Vince (2012) brought emotions to the forefront in institutional analysis, many scholars have followed suit incorporating emotions from different angles. Some studies explore emotions as important causal mechanism, or antecedents of institutional disruption and change. GLBT ministers for example experienced strong emotions when caught in the contradiction between institutionalized heterosexism and Christian inclusivity of the Protestant church. Their emotional experience drove them to micro-level identity work to resolve their internal conflict, and to even publicly challenge the contradiction to achieve positive societal level change (Creed et al., 2010). Many social movements gain momentum by drawing on shared emotional experiences as did the creation of the grass-fed beef market where producers felt a “deep emotional connection” with their work (Weber, Heinze, & DeSoucey, 2008).

Other scholars have looked at emotions as endogenous consequences of the institution. In the institutional logics perspective, each institutional order defines, in addition to practices,

beliefs, and norms, the emotional register, which regulates the way in which emotions are used and expressed within the institutional order (Toubiana & Zietsma, 2017). Emotional competence is then the capacity of the individual not only to display the appropriate emotions, but to feel appropriately, ensuring authenticity and legitimacy as an institutional actor (Voronov & Weber, 2016). Emotions are therefore integral not only to institutions but to professional identity, as shown by doctors (Wright et al., 2017), pilots (Fraher & Gabriel, 2014), paratroopers (Thornborrow & Brown, 2009), and store artists (Endrissat et al., 2016).

That emotions can be disciplined by the institution and people can be made to feel a certain way by the institution is a difficult concept to accept when emotions seem to originate from the person. Friedland (2017) explores this idea and distinguishes “basic emotions—like fear, anger and disgust” which are “affects prior to and independent of representation and cognition” and therefore exogenous to institutions, from the “many emotions [that] are hardly basic—greed, loyalty, patriotism...[which] are institutionally constituted and constitutive.” Whereas in some cases emotions occur apart from institutions, in other cases institutions produce and energize emotions “such that our emotions are part of an institution’s production functions.” These emotions become a part of the “doing and being” as a subject of the institution, animating practices, desires and values, affording “aliveness” and a sense of purpose to institutional practices.

Yet the mechanism of how institutions constitute emotions remains unclear. To address this question, I turn the focus from emotions to its direct antecedent—desire. For analytical purposes, we assume that all emotions can be understood in terms of a desire that precedes it, whether conscious or subconscious, as a reaction to whether a desire has been fulfilled, frustrated or anything in-between. The reason for choosing desire as the subject of inquiry is because it

combines a cognitive awareness with a reinforcing emotional and bodily affect. Though some desires are subconscious and lacking in cognitive understanding, these desires can potentially be brought to consciousness through reflecting on their emotional affect. Desire, as it exists in its preconscious state, is inevitably channeled from internal experience to external enactment, and in so doing, forced into institutional systems of meaning. If it is unlikely that institutions control the biology of emotions, it is well-documented that institutions shape the cognitive frameworks and the language used to express and articulate desires, as well as the social norms that dictate which desires are acceptable and how they should be pursued or subdued. If the cognitive aspect of desire can be disciplined, then half the work is already complete, the intertwined emotional component continuously drives and reinforces the institutionally constituted desire. At the same time, despite institutional influences on the cognition of desire, emotions ground desire into the core of one's personhood, so that it is experienced as belonging undoubtedly to the self. Desire in itself feels original, authentic, and reflective of one's "true" character.

Though the focus here is on the emotions, it is desire that is "inherent in institutional life... in the way we love the principle of our animation" (Friedland, 2017). Desire is decidedly central to institutional actorhood and from it springs forth actions, cognitions and emotions. Institutions discipline people by disciplining desire and one who desires correctly, also acts, thinks and feels correctly, thereby becoming an institutional actor.

2.5 Institutional ethos as morality and the core of identity

The disciplinary mechanism that shapes desires that then determines emotions is through the institution's ethos. As the institution's highest ideals, ethos brings together the values that exemplify the profession or the institutional order. Ethos provides moral and aesthetic

justification for emotional investment and draws emotional energy that then animate and infuse meaning into the otherwise abstract and impersonal institutions.

In the institutional logics perspective, which conceives of society as inter-institutional, each institutional order is characterized by a central guiding logic that organizes beliefs, norms, practices, discourse and values (Friedland & Alford, 1991), including ethos. Ethos, which is essentially a bundle of values, are distinguished from other kinds of logic values for possessing a moral quality, that is, being valued as an end in itself. Other values may serve as a means to a higher end, even if they are “infused with meaning” in their own right, however values of the ethos demand no further justification, and is considered simply good and worthy of pursuit.

To illustrate, in the scientific profession, sociologist Robert Merton (1973) identified organized skepticism as one of the values of the scientific ethos. Organized skepticism requires the suspension of judgment in the absence of evidence and drives the relentless search for verifiable and reproducible results. It is a defining characteristic of science and is upheld for its own sake whether the results lead to answers or more questions. For the scientist, failure to abide by the ethos goes against the spirit of science and is therefore immoral. Politicians, on the other hand, routinely make decisions based on non-conclusive evidence as is their responsibility and burden. The merit of their actions is judged not by the criteria of scientific ethos but by the ethos of politics—negotiation and discernment, perhaps. Each institutional order and each profession is defined by its own unique ethos (Fayard et al., 2016; Voronov & Weber, 2016), providing a sense of higher purpose and meaning that allows it to transcend the rational, conventional, or historical *raison d’etre* of the profession.

The key characteristic of the ethos is that it is an ideal, in which the good and the desirable merges, which are not always concurrent. While desirability refers to the individual’s

preferences, goodness is defined institutionally. Defining goodness, and therefore the bad, is an imposition of a moral code espoused by the institution's ethos, and herein lies its disciplinary power.

If ethos is morality, then it is disciplinary. Morality and discipline are inseparable constructs, and numerous systems of moral values varying in time and culture enforce morality in a variety of ways. But the most effective forms of discipline are those that *subjectify*, a concept that has appeared in disparate streams but nonetheless share some commonalities. In Berger and Luckmann's *Social Construction of Reality* (1966), an objective reality is internalized and subjectivated, or made subjectively real to the person. Subjective reality provides coherence, meaning, identity, and enables social interactions. The element of discipline however is more explicitly stated by Foucault (1977). In his illustration of the panopticon, where each prison cell is illuminated and exposed to a central tower housing an invisible observer, "the major effect of the Panopticon" was "to induce in the inmate a state of conscious and permanent visibility that assures the automatic functioning of power". The external observer always invisible and omnipresent becomes internally retrojected so that the self observes the self, thereby subjectifying the self to permanent and self-imposed surveillance. Most recently in institutional theory, the role of shame in subjectification was explored, where people observe themselves "in the perspective of others and imagining their assessment of the self" and live in constant anticipation and avoidance of shame (Creed, Hudson, Okhuysen, & Smith-Crowe, 2014).

What these theories of subjectification share is the internalization of an external criteria into the person's cognitive and affective being to induce self-discipline and self-regulation, the mechanism with which professional ethos subjectifies professionals by shaping their desires. The institutional order teaches its subject that the ethos is good and that it should be desired. By

adopting these desires, people go on to pursue ethos and to live and feel the emotional experience of pursuing, succeeding and failing to uphold the ethos, thereby participating in the institutional order as an authentic actor. Through desire, upholding ethos is made automatic and self-motivated, and perhaps can be seen as a positive form of discipline opposite shame. Ethos, therefore, is much more than “rules of the trade” to play along with, but functions as morality.

The significance of ethos as morality that subjectifies people is how intimately it is bounded to identity and one’s self-conception. Similarly, moral identity (Aquino & Americus, 2002; Kennedy, Kray, & Ku, 2017; Winterich, Aquino, Mittal, & Swartz, 2013; Xu & Ma, 2015) and value identity (Hitlin, 2016; Hitlin & Piliavin, 2004) has been explored in literature. Aquino and Reed (2002) conceptualizes moral identity as a parameter of social identity in which collective and shared moral values allow people to identify with a social group. This perspective suffers from the same pitfalls as the in-role perspective where one’s social and moral identity is only salient depending on external circumstances. While this makes sense when we acknowledge that family and professional morals can be different and activated according to circumstance, this perspective misses the possibility that a particular moral identity can be all-encompassing or potentially an overarching organizing principle in a person’s life. Hitlin’s (2002) concept of value identity comes closer to mark. He posits value identity as a core of personal identity, an underexplored concept in the identity literature, because values define desirable end goals, are trans-situational, and guides behavior and actions. In Hitlin’s view, values are a cohesive force for the many roles and identities a person may possess and anchors multiple identities onto an overarching personal identity. While I focus on professional and not personal identity, I argue that morality and subjectification bring ethos to the core of professional identity, providing a

compelling explanation for emotional and passionate identification to one's profession more so than the existing cognitive and discursive aspects of professional identity.

The link between emotions and ethos, while theorized, has yet to be operationalized and supported empirically. Through this study, I examine postdocs' internalized understanding of the scientific ethos and the salience of such ethos throughout their material practices, social interactions and emotional experience that occur at work, but also outside of work. Specifically, I explore the research question: *What are the mechanisms that enable identification and internalization of institutional ethos so that it becomes incorporated and maintained in professional identity?* Focusing on the moral nature of ethos sets the stage for relevant emotional experiences that foster the sense of self as a professional, as well as passionate commitment as an institutional actor.

3. Methods

3.1 Research context and setting

In order to build theory on how emotional investment occurs in relation to professional ethos, I employed an inductive, grounded theory approach to allow for unexpected and emergent themes (Corley & Gioia, 2004). The sample consists mainly of postdoctoral researchers from both academic and national lab settings spanning the basic and applied sciences, as well as spouses and partners of postdocs. As the partially socialized, "in-between professional" who have completed their education yet are not independent scientists, postdocs are ideal for observing professional identity development and the emotions associated with a new and defining career stage.

As it is intended to be a training stage, postdoc appointments typically last two to three years, and scientific research is carried out under supervisors at a pay grade much lower than other occupations requiring similar educational levels. Once considered an optional career building stage, it is increasingly perceived as necessary in gaining an academic or a research-focused employment. The last few years have also seen an increase in postdocs taking on second, even third appointments before landing a permanent position (Åkerlind, 2005; Chen et al., 2015; Singer, 2000).

I expect the postdocs to exhibit a strong sense of scientific ethos, most likely instilled throughout their lengthy educational period. This is partially explained by science being a highly-institutionalized field with a long history and a strong presence in society and popular culture. Several trends in the postdoctoral population however make them more susceptible to an unusually strong commitment to ethos. First, about 2/3 of postdocs in 2015 were foreign-born, (National Research Council, 2005; Walsh, 2015). Postdocs leave behind family and social networks, often to be supplanted into new national, cultural and societal environment. While it took strong work commitment to make such a move in the first place, postdocs' immersion into their new work environment makes it more likely for work to become a central source of meaning and identity (Yu et al., 2015).

Secondly, the appointment often coincides with the stage of life where people start families. This requires the commitment of not only the postdoc but of significant others who are affected by the requirement to move every few years. For this reason, I included postdocs' significant others into my sample. In addition, the transition from singlehood to family life often brings new meaning to one's career, as it becomes the means to support one's family.

3.2 Data Collection

To establish a multi-level analysis from institution to individual, I drew from two sources of data. The primary data was collected via snowball sampling (O’leary, 2004) through semi-structured interviews over a one-year period from 28 participants: 17 postdocs (6 women, 11 men) and 14 significant others (13 women, 1 man) (See Table 1a and 1b for details). Two participants fell in both postdoc and spouse category. All postdocs were in their first employment after graduation, in various stages between 1 to 3 years, except for one who is currently in a second postdoc, and another who is now an assistant professor. The participants represent thirteen different countries or territories of origin (Australia, Austria, Canada, China, Georgia, Mexico, Nepal, Puerto Rico, Romania, Russia, Switzerland, Turkey, United States). All but one made a significant geographical move for the postdoc, however all participants made a significant geographical move for either the PhD, the postdoc, or both. 11 out of 15 postdocs lived with a spouse or partner, and 8 of those had children. 11 out of 14 significant others had children.

Table 1a: Demographic Table of Postdoc Interviewees

Participant	Postdoc	Gender	Country	Age	# of PD	Months in PD	Marital Status	Children
Postdoc	Maria	F	Austria	30	1	18	Partner	0
Postdoc	Nicole	F	Canada	34	1	18	Single	0
Postdoc	Sara	F	China	29	1	7	Single	0
Postdoc	Carol	F	China	30	1	5	Single	0
Postdoc	Laura	F	Turkey	35	1	18	Single	0
Postdoc	Chris	M	Austria	31	1	18	Partner	0
Postdoc	Sam	M	China	30	1	24	Married	1
Postdoc	Peter	M	USA	31	2	20	Married	1
Postdoc	Kevin	M	China	33	1	13	Married	0
Postdoc	Nick	M	Georgia	36	2	36	Married	2
Postdoc	Tony	M	Mexico	31	1	8	Married	3
Postdoc	Jay	M	Puerto Rico	45	1	14	Married	1
Postdoc	Brandon	M	Australia	34	2	30	Married	3
Ex-PD	Paul	M	Canada	37	1	24	Married	3
Ex-PD	Michael	M	USA	35	1	24	Married	3
Ex-PD	Luke	M	Russia	38	1	24	Married	2
Total = 16		5F/11M		Ave = 33.7		18.8		

Table 1b: Demographic Table of Significant Other Interviewees

Participant	Spouse	Gender	Country	Age	Education	Children
Spouse	Anne	F	Georgia	35	Master	2
Spouse	Lisa	F	China	29	Master	1
Spouse	Nancy	F	Romania	35	Master	1
Partner	Carrie	F	China	27	Bachelor	0
Spouse	Jessie	F	Nepal	35	PhD	2
Spouse	Linda	F	China	29	MD	1
Spouse	Irene	F	China	34	PhD	1
Spouse	Diane	F	Canada	36	Master	3
Spouse	Cathy	F	Mexico	31	Bachelor	3
Spouse	Brianna	F	Switzerland	32	Master	0
Spouse	Gail	F	Puerto Rico	42	Bachelor	1
Spouse	Kate	F	Russia	28	PhD	0
Partner	Maria	F	Austria	30	Postdoc	0
Partner	Chris	M	Austria	31	Postdoc	0
Total = 14		13F/1M		Ave = 32.4		

The interviews lasted between 30 minutes to 1.5 hours and questions focused on general postdoc experiences, relationships with supervisors, and aspects about research and science. The questions were intended to elicit emotional expressions as well as the values that were significant to the experiences they were describing. A set of questions focused on how the postdoc affected their families and spouses and how it impacted their role in the family. Interviews with significant others included questions about their spouse’s experiences in the postdoc, how the postdoc has affected their personal and family lives, and how they see their role as a spouse of a postdoc.

I took into consideration that specific words and language used to describe emotions can differ significantly from person to person, but that these differences can be more pronounced for this sample, who for 24 out of 28 interviewees, English was not the first language. Emotional language was far from standard, and for many, limited in terms of vocabulary and idioms available to the individual for narration. In order to overcome these challenges, I opted for face-to-face interviews, though five were conducted on video chat, where I would be able to capture

non-verbal cues for emotional expression. I took notes of these non-verbal cues and the time of the recording and later typed it into the data. Examples of non-verbal cues that I anticipated include facial expressions, gestures, changes in pace and rhythm of speaking, pauses and other body language.

Secondary data was collected from a variety of sources for the purpose of gaining a sense of ethos at the institutional level that is most likely to be widely communicated to the scientific community. I collected 50 published scientific articles, editorials and news from *Science* and *Nature*, two of the most prestigious and prominent journals that this particular sample aspired to published in. I also included the mission statements, strategies, and ethics codes of 30 prominent scientific societies (15 North American and 15 European) spanning different scientific disciplines. As mission statements are typically written for the public, ethos was typically more explicit. The variety of written material will aid in capturing dimensions of scientific ethos that is widely shared among specific disciplines and inclusive of particular cultural and geographical contexts.

3.3 Analysis

The data was analyzed iteratively, switching back and forth from data to emerging themes, and occurred in the following three stages.

Stage 1: I was interested in how scientific ethos is communicated to and therefore internalized by postdocs, so I began with the secondary data to first identify ethos that existed at the institutional level. As ethos is defined as end values that define and characterize science, I conceptualize values as desirable end states that are trans-situational, orient behavior and guides evaluation (Hitlin & Piliavin, 2004; Marini, 2001). While coding the scientific articles and

mission statements, I searched for statements that expressed an ideal, looking out for terminology such as “should” and “ought” that indicate idealization. The variety of documents and the many scientific disciplines represented confirmed that values that came up consistently transcended disciplinary boundaries and situational contexts, but clearly attributed to science in general. Through coding, I noticed some parallels to Mertonian norms and borrowed several terms such as “skepticism” and “disinterestedness” to best describe my observations (Merton, 1973). The coding converged to 8 dimensions of ethos at the institutional level: curiosity, disinterestedness, autonomy, collaboration, integrity, skepticism, impact, and communication, which will be further discussed in the Findings.

Stage 2: I coded the interviews independently from the secondary data, and in the beginning coded broadly for emotional experiences and articulated values. After coding the first few interviews, several problems became apparent when coding for emotions stemming from the fact that emotions are essentially non-discursive. Emotions must be translated into appropriate words that not only indicate the emotion but fit in the syntax of the utterance and the context of the narrative being told. During this translation process, the expressions of emotions become non-uniform the boundaries between what is an emotion and what is not becomes blurred.

First, the emotional register of science, meaning the emotional displays that are deemed appropriate for scientists, tend to be rather low in terms of expressiveness, resulting in emotionally-neutral and psychologically distancing language (Dunn & Jones, 2010; Toubiana & Zietsma, 2017). Several postdocs described positive experiences as “really good” or “that was cool”, opting to articulate the evaluation of an experience rather than the emotion. Second, as anticipated, non-verbal cues enriched the interviewee’s narrative since they indicated much more intensity of emotions than was expressed through words alone. Several postdocs recounted

difficult life experiences such as suicidal thoughts and anorexia. While they explained these events matter-of-factly, almost objectively, they often paused before beginning, and spoke more slowly and carefully as if they were reflecting upon their memories as they were speaking. It was clear these were emotionally sensitive memories. When expressing anger, one interviewee widened her eyes and gestured dramatically as if in disbelief, and in expressing disappointment, another interviewee spoke while shaking his head and shrugging his shoulders. Positive emotions were expressed through smiles, leaning forward and nodding one's head. These non-discursive emotional cues provided clear indications to the emotions that were salient but unarticulated. While body language alone may vary given the country and cultural background, the context of the interview as well as follow-up questions helped to clear any ambiguity about the emotion expressed. Since the goal was not to enumerate or distinguish emotions, but to understand its connection to ethos and professional identity, it was not problematic for emotional expressions to remain non-verbal. The cues aided in identifying emotionally significant episodes from which I was able to probe for values and themes of identity.

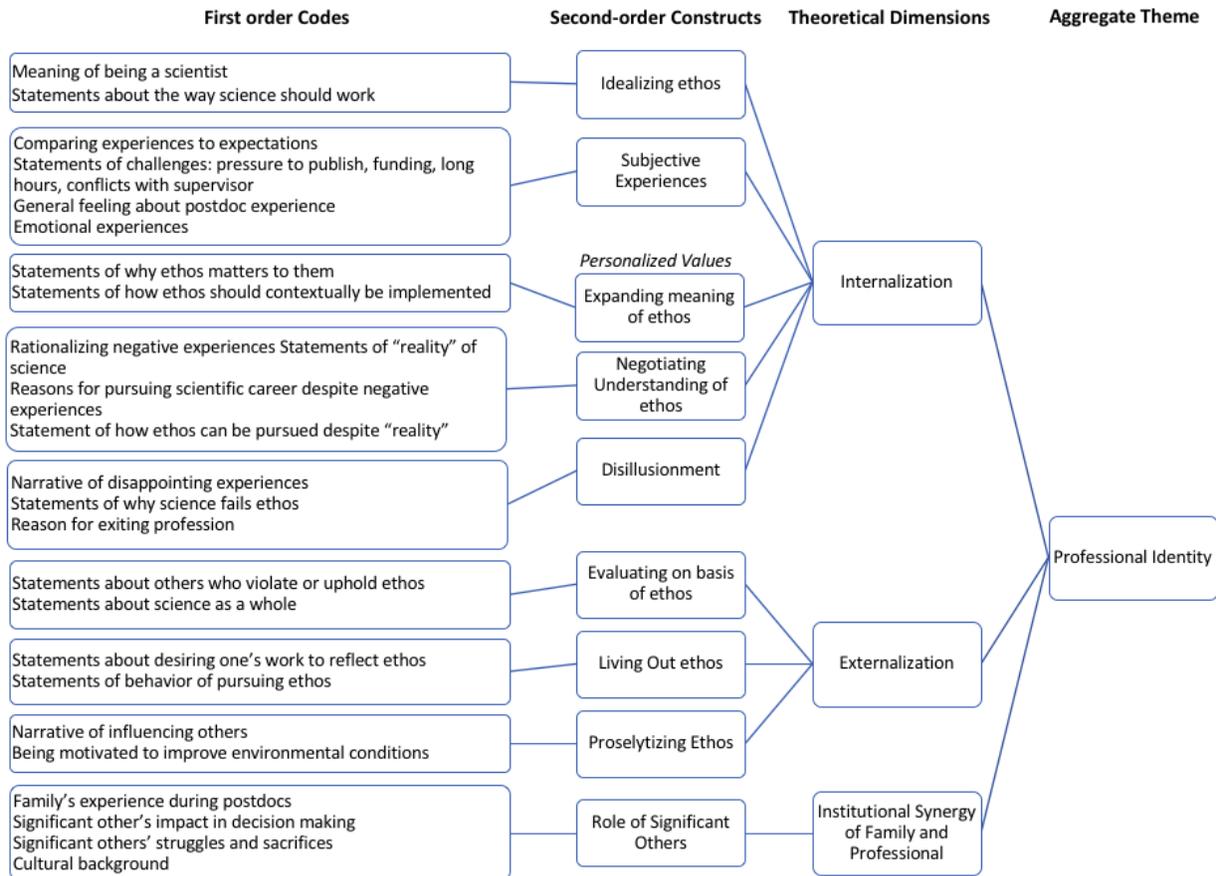
I also coded for common sources of emotional experiences such as pressure to publish, conflict with supervisors, funding, uncertain job prospects, and family dynamics. These common experiences help connect emotions with values that became salient during particular episodes.

For significant others, I coded for ways in which interviewees related to and interacted with their postdoc partners, such as encouraging, co-decision-making, etc. I also coded for aspects of their lives that were impacted by the postdoc, such as career, education and family planning.

Stage 3: After coding the primary and secondary data broadly and independently, I began looking for connections between the institutional ethos and emotional experiences. I searched

for higher-order themes by examining the contexts with which postdocs described ethos and the associated emotional experience. The categories that emerged described either internal experiences or external perceptions and actions. I then connected these themes to one’s self-understanding (professional identity) and their role in upholding science ethos (institutional actorhood). These connections helped organize divergent experiences and outcomes, and pinpoint where in the process certain splits occur, particularly the split between remaining within the profession and exiting the profession. Figure 1 shows the data coding structure to illustrate how higher order themes emerged from first order constructs.

Figure 1: Overview of Data Structure



Analyzing the role of significant others yielded surprising findings, as postdocs and significant others influenced each other in profound ways. The significant others’ beliefs about

marriage and family often motivated them to support their partner's profession, and at the same time, the postdoc became an important part of their own identity because of their sacrifices and personal investment in their partner's career path.

4 Findings

In analyzing the data for the way ethos conditions emotional experience and professional identity, I first examined secondary data to gain an understanding of institutional-level ethos and from which eight dimensions of ethos emerged. Of these eight, five became prominent topics in the personal experiences of postdocs that came up in the interviews. I then found three ways in which the postdocs progressively internalized ethos values (idealizing, subjectively experiencing, and personalizing), and three ways ethos was externalized (evaluating, living out and proselytizing).

4.1 Scientific ethos at the institutional level

From the secondary data, eight distinct dimensions of ethos emerged from the scientific articles and mission statements of scientific societies that exemplify and idealize science: curiosity, disinterestedness, autonomy, collaboration, integrity, skepticism, impact, and communication (see Table 2). Curiosity refers to the ideal that scientists are driven by the need to ask questions, learn and attempt to understand the unknown. Disinterestedness refers to the principle that scientific endeavors should not be motivated by incentives other than scientific progress such as financial or political gains. Autonomy refers to the independence of the scientist in pursuing research questions, designing and executing research procedures. Collaboration refers to both formal and informal arrangements, where it leads to conducting research and publishing together or general social interactions that serve to support one another in their scientific pursuits, such as brainstorming, mentoring, advising and critiquing one another.

Table 2: Scientific Ethos – Secondary Data

Dimension	Description	Quotes
Autonomy	Autonomy in research/experimental design, execution and analysis	Lab heads also need to ensure that their younger lab members maintain a sense of autonomy rather than of cog-in-the-machine. <i>2011-9-1 Nature</i>
Collaboration	Working with others formally leading to co-publications and informally through conversation, mentoring, advising, and critiquing one another	The current political tensions could all too easily block these avenues of collaboration, which would harm not only Western interests but those of Russia’s researchers too...What should follow is an equal scientific partnership based on mutual trust, respect and responsibility. <i>2008-9-4 Nature</i> Getting all of these agencies to coordinate their nanotech research activities has been one of the NNI’s key successes. <i>2010-9-2 Nature</i>
Communication	Communicating science to the public and non-scientific audiences to raise awareness and promote a deeper understanding of science	AGU Strategic Objectives: Expand training, recognition and reward of AGU scientists for excellence in communicating science to nonscience audiences. The core purpose of the ANS is to promote the awareness and understanding with regard to the application of nuclear science and technology.
Curiosity/Passion	Scientists are motivated by curiosity and the drive to learn and pursue research with passion.	But none of that dimmed his obvious passion for a subject that his listeners found both mystifying and enthralling: nanotechnology. <i>2010-9-2 Nature</i> As a group, [postdocs] are characterized by passion, dedication, vitality, their considerable abilities, and their drive. <i>2017-9-8 Science</i>
Disinterestedness	Being motivated only to make scientific progress, not financial or political gains	...far more detail will now be reported by institutions to the NIH about each identified conflict, including the approximate dollar value of the interest and the measures being taken to manage or eliminate the conflict. <i>2009-9-03 Nature</i>
Impact	Positive impact to the scientific community and to the wider society	The need to turn scientific findings into commercialized products is also a key theme in the latest assessment from the President’s Council of Advisors on Science and Technology, as well as in legislation pending in the US Senate to continue the NNI’s funding. <i>2010-9-2 Nature</i> Major funding agencies such as the U.S. National Cancer Institute should enlarge their view of what constitutes cancer research, recognizing that often the discoveries that have the most profound impact on cancer treatments emanate from basic research on model organisms, rather than from studies of highly complex human tumors. <i>2009-9-11 Science</i>
Integrity	Integrity of conducting research correctly, rigorously, and thoroughly using best methods and latest technology	The critics respond that they are simply pointing out flaws in research, and that this is an important part of the scientific process. <i>2009-9-11 Science</i> The necessity for hard work in science has long been emphasized... Anyone lacking the inner intellectual drive and a capacity for relentless focus to get to the heart of the way the world works should stay away. <i>2011-9-1 Nature</i>
Skepticism	The tendency to constantly question, re-test and critique one another’s works and the unwillingness to accept conclusions without clear evidence	To try to dismiss the research out of hand ignores how science is supposed to work...you make a hypothesis, test it, refine it, test it and refine it again. <i>2009-9-3 Nature</i>

Integrity is the quality of research, in its rigor, robustness and accuracy. Skepticism refers to the tendency to constantly question, re-test and critique one another's works and the unwillingness to accept conclusions without clear evidence. Impact refers to both scientific contribution to one's own discipline and a wider positive impact on society. Communication refers to communicating scientific knowledge and progress to non-scientific audiences and the public to raise awareness and promote a deeper understanding of science.

These dimensions of ethos at the institutional-level provide a basis for understanding how postdocs come to understand scientific ethos as something they have been socialized into, and incorporate into their professional identity.

4.2 Individual level internalization

I identified three ways in which postdocs experienced ethos internally: 1) the postdocs expressed the ethos as an *ideal*, 2) the postdocs described *subjective experiences* and intense emotions connected to ethos, and 3) the postdocs came to a *personalized understanding of ethos*. These stages can be understood for analytical purposes as processual, though in reality the process is ongoing and cyclical and remain in constant dialectical tension. The process represents how ethos, over time and experience, becomes further internalized.

4.2.1 Idealizing ethos

The postdocs spoke of the various values of ethos as an ideal in science, the way science or scientists *should* be because it is both desirable and good for science. These ideals were described in simple and abstract terms, without the complexity or tensions that often accompany real-world situations.

For example, the postdocs believed scientists should be “driven by curiosity”, as stated by Chris, a physicist from Austria. Brandon, a physicist from Australia who is currently doing a second postdoc, explains “being a scientist means that you explore questions that don’t have answers... about the physical world that we don’t understand”. Both Chris and Brandon compared science with the private sector to emphasize how the motivation of curiosity is more ideal than being motivated by profit.

The postdocs also believed in autonomy to pursue scientific work especially if one is driven by curiosity. Chris had said, “in science, I think you have more freedom to do what you want because you’re kind of looking at things you’re interested in...you’re driven by yourself, by your curiosity”. Even while working under supervisors and the scope of research is limited by funding, the postdocs believed they should have the autonomy to define the scientific problem and utilize their expertise in designing and executing experiments.

Collaboration was also commonly idealized. Peter, an American biochemical engineer, believed it “paramount to have [collaboration]” in science, “if you’re not working with other people you may not be able to fully answer the questions you’re asking.” Chris, the Austrian physicist said, “there has to be interaction between the people” and without such collaboration, “science will stagnate.”

These ideals were expressed as part of their expectation coming into the postdoc which signifies that they were instilled well before the ethos, most likely during their lengthy educational period.

4.2.2 Subjective experiences of ethos

The postdocs described various subjective and emotional experiences related to ethos, both positive and negative and in varying intensity, that stemmed from whether the ethos was

upheld or violated. The strong emotional reactions indicate that the desire for the ethos is authentic and deeply personal for the postdocs.

Pursuing curiosity was often a source of positive feelings and excitement for many postdocs, as described by Peter, “it’s really exciting to get things to work the way you thought they should or would or answer the question that you’re asking. That’s great. That’s really, really great.” Peter emphasizes that it is not necessarily finding answers, but the process and the drive of asking questions and searching for answers that captures the spirit of the scientists’ curiosity. Jay, a Puerto Rican physicist, says, “We’re doing things that are groundbreaking in a sense...that’s cool you know. And that’s a lot of fun for me. I like that.”

Seeing the impact of one’s work was another source of positive emotions for many postdocs. Michael, an American chemist, related, “I enjoy every time I see that somebody cited one of my papers. Because that means somebody’s using what I did...That’s cool because I just appreciate that what I did had an impact and, you know, that people actually cared...And even if it’s just within my field.” Carol, a physicist from China, says, “the most rewarding moment is once your work has been acknowledged by others, once your work has been published and there is a media report and people get interest in your work...So I think that time makes me feel my work is valued.”

Some negative experiences stemmed from the lack of autonomy. Maria, a climate scientist from Austria, described how her supervisor would “override” her ideas. She said “I thought I could work more independently...And it’s frustrating. It really is frustrating.” Maria did not receive positive feedback for acting autonomously and contributing her skills and expertise. Instead, she felt that her lack of autonomy dampened her ability to problem-solve, experiment with different approaches, and ultimately grow as a scientist. The violation of this

ethos led to negative emotions that only strengthened her desire for the ethos, demonstrating that once the desire is instilled, both positive and negative emotions help reinforce it.

Experiences with integrity of research provoked some of the strongest reactions from the postdocs. Paul, a Canadian physicist, described how he felt when some researchers came up with potentially biased results before formulating a question: “I was disgusted, honestly. I just—I think it’s a disservice [to care about publishing more than science].” Chris, the Austrian physicist, had come up with results that his supervisor wouldn’t let him publish because it didn’t agree with the mainstream. He says, “I kind of really hate this sensational concept of publishing papers.” Sara echoes a similar sentiment: “I think the American scientists is quite—disappoint me a lot because some very good scientists—they are publishing papers that is very poorly written”, also due to the pressure to publish. Nicole, a Canadian biochemist, described how she felt when she learned of the political aspect to the science funding system: “I guess I felt like the playing field wasn’t as fair...And so then the fact that he was kind of revealing the cards that it wasn’t fair, was a little bit, not a little bit, like it was saddening to me”.

Many of the strong emotional reactions were episodal but had profound impact on the way the postdocs felt about their appointment, about science and meaning of their profession.

4.2.3 Ethos as personalized values

The subjective experiences deeply impacted the way postdocs understood ethos, the institution of science and their role as a professional scientist. Ethos often became modified as postdocs came to a much more personalized, rather than institutional, understanding of ethos. There were many more variations in the personalized values than there were in the idealized versions of the ethos, reflecting the many disciplines, supervisor’s personalities and different departmental cultures that the postdoc experienced. For example, some postdocs expanded and

deepened the meaning of the ethos beyond the idealized meaning, while others tempered the loftiness of the ideal to a more realistic understanding, and still others became downright disillusioned about the institution of science.

Expanded meaning of ethos - When ethos values were upheld or frustrated triggering strong emotions, the experience often altered the meaning of the ethos for the postdocs, expanding and deepening the significance of the ethos beyond its idealization. Their understanding of the ethos is no longer an abstract idealization, but a deeper realization grounded in personal and emotional experience.

Nicole first talked about collaboration as helping the members' scientific progress, however when such collaboration and general social interaction was missing in her postdoc life, it was the isolation and feeling unimportant that bothered her more than the direct effect on her research. She says, "the more people communicate, the more you feel like your project matters...If you feel like your project's important as well as if you have some positive reinforcement, get you through those times. 'Cause I really do feel like it's more climbing than coasting. And so I think you can get that from your lab members." As Nicole expands the role of her lab members as not only providing scientific support but emotional support as well, she expands the meaning of collaboration from mutual scientific contribution to providing community membership where there is positive feedback and emotional support. Laura expressed the bewilderment she felt when she received no feedback from her research group:

"I only had two [publications]. So does that make me a bad prospect? Does that make me an awful one? Should I kill myself, or should I go home? Should I quit this business? See that's the problem. If you don't get regular feedback, nobody knows if you're progressing...So you miss—maybe there is some sort of emotional connection...but I'm missing the human part of the work life."

The ethos of collaboration takes on a deeper meaning that includes social connections and becomes an important personal value.

In another example, Kate, a graduate student working in a national lab, revised her understanding of scientific ethos when she realized through her studies that impact is not a prioritized value in science. She explains, “you will see some of them study complete crazy subjects. ‘Cause zero application. Yeah, so I think there is joy in solving very difficult problems.” In her perception, impact is not a part of the scientific ethos and felt frustrated that for her own dissertation, “nobody needs to [even see it].” Kate personally values impact for her own career however (“I really want to see the impact of my work”). For this reason, she has opted not to pursue a postdoc and a career in science. In this case, the value of impact takes on greater importance than the profession itself and leads Kate to other careers where she feels this value can be better fulfilled.

Chris, the Austrian physicist, describes the ethos of integrity in his own words: “[Being a scientist means] to stick to your principles in the sense that you convince yourself always first before you try to convince others.” Chris has come to this understanding of what it means to be a scientist through his experience witnessing those around him publishing papers based on inaccurate results. He explains, “if they don’t fit with the experimental results, then people don’t publish it... They don’t check the accuracy of their results is okay or if the error is fine. So they don’t really, in my opinion, convince themselves that their thing’s right.” For Chris, the purpose of integrity, rigor and accuracy of research is to convince oneself more than convincing the one’s peers.

Negotiated understanding of ethos - A negotiated understanding of ethos occurs when through a social interaction the postdoc experiences or witnesses a violation of ethos. Through reflection

however the postdoc is able to understand the meaning behind the action or interaction originally perceived as ethos-violation. The postdoc eventually comes to an understanding where part of the idealization remains but in a more tempered, realistic way. The postdoc negotiates the ideal with reality and acknowledges the tension that exists between the positive and negative aspects of ethos.

The pressure to publish for example was a common topic and was often described as overwhelming and having negative effect on the integrity of scientific research. Peter, the American biochemical engineer, recognizes the negative effects but offers a rationalization: “So I think the pressure to publish can hurt science if it’s not balanced...I do think, you know, the pressure to publish is important. Because if you just are handing people a few million dollars and being like, you know, take your time and kind of do this, maybe people would be more lackadaisical about it.” Peter has seen cases of “modification of data, creation of data, a lot of outcomes we wouldn’t want to see,” and fully acknowledges his negative experiences, incorporating it into his understanding of how integrity plays out in the real world. Yet he remains hopeful that “if you’re doing research in the best possible way you’ll get both.”

Nicole described an incident where her supervisor asked a colleague, who was close to solving the same problem he was working, to hold off on publishing until he had solved the problem himself. As a result, the two publications came out simultaneously. Nicole described how she felt “naïve in that sense in that I believed it was all good and pure and that there wasn’t, like, the backstabbing so much or the—and I’d never really seen the competitiveness.” Despite having seen the political side of science, in the end, she says “it never completely destroyed my faith in science or my faith in the scientific community” and she continues to pursue her passion and career in scientific research.

Disillusionment of ethos - Extreme negative experiences resulting from ethos violations lead several postdocs to become completely disillusioned and believe that ethos is not and cannot be upheld in science. They end up exiting the profession altogether despite having invested years into their education and career. Interestingly, these postdocs exhibit strong commitment to ethos, but the negative experiences cause ideals and reality to become decoupled. Rather than abandoning the ethos as unattainable, postdocs remain committed to ethos and look for alternate careers that will allow them to better adhere to the ethos. In so doing, they prioritize scientific ethos over the scientific career. While some postdocs opt for non-research positions closely related to their postdoc field, others choose to exit completely and choose careers in different industries. It is important to note that when it comes to career changes, ethos and disillusionment are not the only factor in the decision-making, in particular, family heavily influences how the postdocs handle their career moves.

Maria felt that in her postdoc, her work could not have the impact that she valued: “I always wanted to make the world a better place...But I see that the way that things work here, it’s not really...That they would really want to make the world a better place, I don’t see that. So I am a bit disappointed.” She has since decided to pursue a career outside of science, “something in policy making” where she feels she can uphold her personal values. She feels she will always be a scientist and that the analytical way of thinking is “burned into my brain, just how my brain works.”

Chris became disillusioned (“kind of really kills my passion for science”) with the system of science after seeing how the negative cycle of securing funding and publishing leads to sub-par science. He believes the problem is systematic and that “the P.I.’s kind of they are forced into this direction more or less...I think it’s a pity that these big people, that they kind of are not

really interested in science anymore.” Chris has “decided to step out of science” and is returning to his former employment related to software maintenance since it “allows me to do science, but kind of in a non-stressful way.” Chris is committed to the integrity of science and retains his scientific identity despite no longer being a professional scientist.

Tony, a Mexican physicist, has also decided to leave his career partly because he discovered that “you can pay money and you get published” even if “your information is not hundred percent accurate”. He realizes that science is not pure, but combined with being burnt out from years of heavy workload and family demands (wife and three young children), he has decided to return to Mexico without established career prospects. Tony believes that he can pursue science in everyday life, simply by following one’s curiosity and experimenting following the scientific method and intends to retain his scientific identity in this way, partly for the education of his children.

Three ex-postdocs, following disillusionment during the postdoc, chose careers in a field closely related to their postdoc. In the words of Paul, the Canadian physicist, science was populated by “researchers” and rarely by “scientists”, the former caring more about publishing than about the scientific method. He says, “The world works is that there are politicians that are answerable, in this country anyway, to an electorate. And they want to see results that they can sell...So pure science is ideal...but it’s a pipedream.” He does not buy that scientists are following their passion and curiosity and upholding the rigorous integrity standards of the scientific method. He feels that he wouldn’t be a good scientist because he “do[esn’t] follow the game very well” and considered teaching positions. In the end, he discovered his passion for the engineering aspects of scientific research and decided to take a job as an engineer at a national lab working on a particular scientific equipment with which he used to perform scientific

research with. He says, “I don’t consider myself to be a scientist”, but he stayed in his field of expertise as a non-researcher because “despite my problems with the way that scientists purport themselves—professors in particular, I still felt that given my skillset up until that point, that was my best shot for making a real difference in the world.” The ethos of impact is important for Paul and he feels that he can pursue the ethos in his current position better than as a scientist. He has no regrets: “I get to fix it, I get to improve it, I get to tinker, I get to turn wrenches. It’s amazing; I love my job. I love my job.”

Luke, a software developer from Russia, described his reasons for choosing a position focused on software engineering over science, though in the same lab and department as his postdoc: “I like the engineering better and applications rather than discovery. But it’s very tough to compete in this world. So almost everything is discovered and it’s just very tiny bit what you can contribute to this. So I don’t have an illusion that I can become Nobel prize winner.” He goes on to say, “for discovery, you have to prove it and you don’t see the results immediately...in software development it’s immediately rewarding...you can actually test it immediately.” While Luke did not express extreme negative emotions, he does not indicate any belief that he can have meaningful impact as a scientist. In contrast, engineering has more direct and tangible impact and is therefore more rewarding. Family was an important consideration for Luke: “[in science] you can wait for 10 years to get a good result. And during these 10 years everything can happen. And family cannot be happy and—so that’s a problem.” His wife in particular had difficulties adjusting to life in America and so job security was particularly important for Luke.

In each case, the postdocs disillusionment comes from a strong attachment to ethos that, through negative experiences arising from ethos violation, becomes decoupled from what they

perceive as reality. Seeing no way to resolve the disparity, the postdocs look for alternative ways to better adhere to the ethos, essentially prioritizing ethos over the profession.

One exception was Michael who was motivated by family reasons rather than disillusionment. Michael's decided to leave the elite-level research arena for a position at a teaching-focused junior college because of the long hours and constant pressure to publish encroaching upon his family life (a wife and three young children). Michael did not find the scientific career to be a sustainable one given his family role. He is happy in his current position that allows him to conduct research and publish at his own pace albeit with time and financial limitations. In this case of professional exit, the driving force was not disillusionment and the desire to uphold ethos, but a desire for better balance between his professional and family life.

Table 3: Internalization of Ethos

Idealizing Ethos	Autonomy	“In science, I think you have more freedom to do what you want because you’re kind of looking at things you’re interested in...if you work for a company sometimes you kind of are pushed into a direction you don’t want to go”
	Collaboration	“There has to be interaction between the people. Otherwise first of all science will stagnate because people are just repeating themselves” “I think it’s paramount to have [collaboration]...if you’re not working with other people you may not be able to fully answer the questions you’re asking. Because you may just be limited by your understanding of how to ask that question or the tools that are available to ask that question”
	Curiosity	“Being a scientist means that you explore questions that don’t have answers”
	Impact	“Making the world a better place is absolutely a part of being a scientist.”
	Integrity	“[Being a scientist means] to stick to your principles in the sense that you convince yourself always first before you try to convince others.”
Subjective experiences	Positive	“I really enjoy the freedom and the interesting things you get to do when you do research...I find it really fun that people pay you just to come up with ideas and do stuff. It’s kind of an open-ended—and you have a lot of freedom and it’s—yeah, it’s just really, like, fun sort of interesting job” “I’d say that what gets me every day to be excited is the finding out new stuff.” “It’s really exciting to get things to work the way you thought they should or would or answer the question that you’re asking. That’s great. That’s really, really great” “...it’s amazing what happens when you follow the scientific method. Come up with a question, see what happens.” “The most rewarding moment is once your work has been acknowledged by others, once your work has been published...That eventually what you did have value for others”

	Disillusionment	<p>“I guess too that people are selfish...you think something can help you, you might have more to help in—helping somebody else”</p> <p>“And to me, that—it burst my bubble of, I suppose of science being—like academia being pure...[but] it never completely destroyed my faith in science or my faith in the scientific community”</p> <p>“It’s very tough to compete in this world. So almost everything is discovered and it’s just very tiny bit what you can contribute to this. So I don’t pre- have an illusion that I can become Nobel prize winner so—for me I understand that. I like coding...I like the engineering better and applications rather than pure discovery.</p> <p>“Every man for themselves. That’s the attitude. No one has to vouch for you. No one has to vouch for your career. No one has to take you to collaborations or—but that’s the environment I’m coming from.</p> <p>“That’s not the way the world works. The world works is that there are politicians that are answerable, in this country anyway, to an electorate. And they want to see results that they can sell. So if they can’t—so if you can’t see your results to them, they can’t sell the results to anybody else. So pure science is the ideal, and I think a lot of scientists would agree in the sense of science in terms of the scientific method. But it’s a pipedream.”</p> <p>“Because I always wanted to make the world a better place...But I see that the way that things work here, it’s not really... That they would really want to make the world a better place, I don’t see that. So I am a bit disappointed.”</p> <p>“Not [passionate] anymore, actually, now that I see that it’s not really people’s intention to make the world a better place or anything.”</p> <p>“I found that also some scientific papers if your information is not hundred percent accurate or, well, let’s say it’s not like very acceptable, you can pay and then they publish your paper. Even though it’s not accurate. So I’m like, where is the science going if it’s— if you can publish whatever you want and you pay money and you get published, then that’s not pure science.”</p> <p>“You know something is not right...but you can still publish that, I think that’s unfair... the problem [is] it’s already accepted. It’s not like you’re doing something illegal. It’s accepted because the system put pressure on publish...so something has to be changed or, I don’t know, but—in my case I’m happy with not taking part.”</p> <p>“Because I realized that really a lot of people, famous people and kind of people with, let’s say, famous people in the field, they don’t really do good science...they kind of are not really interested in science anymore.”</p> <p>“So I think the pressure of publishing paper, before, I thought it was just, like, the pressure of doing a good work. Now it’s more kind of pressure of knowing more people or the kind of social things. I think that’s not good, yeah. Is kind of reality.”</p> <p>“I guess I think that being in academia that we work for a common good of the advancement of knowledge. And so I was really naïve in that sense in that I believed it was all good and pure and that there wasn’t, like, the backstabbing so much or the —and I’d never really seen the competitiveness”</p>
--	-----------------	--

4.3 Externalization of Ethos

I then identified three ways in which postdocs externalized ethos: 1) *evaluating* others on the basis of ethos, 2) *living out* ethos, and 3) *proselytizing* ethos. In this externalization stage, it is presumed that values are internalized and now “activated” to condition perceptions,

rationalizations, behavior and purposeful action. Ethos is projected outwards and influences the way the postdocs interact with the external world.

4.3.1. Ethos as basis of evaluating life

Internalized ethos and personalized values became the frame and the criteria through which postdocs perceived and evaluated individual others as well as the institution of science. Some postdocs reported being disturbed by instances of daily practices of scientific work or the behavior of colleagues that deviated from the ethos they had internalized. For example, Maria felt that the value of impact was not shared by her colleagues and supervisor, “I don’t really see people doing environmental science here, at least my supervisor, that they would really want to make the world a better place. I don’t see that. So I am a bit disappointed.” While Maria had taken on the value of impact for herself, she evaluates others based on her own values. Her disappointment arising from this evaluation confirms this value to herself as authentic and personal.

Several postdocs criticized the way others prioritized the ability to publish over quality research. Canadian physicist and engineer Paul in his own way differentiates a researcher from a “true” scientist, “a research starts with an answer and then tries to come up with the best, sexiest possible question.” He spoke of a colleague who he believes to be one of these researchers, one who prioritizes publishing over quality research:

“...he doesn’t care what happens. Just as long as you can publish it, that’s all he wants to do. His only goal for getting up in the morning is to publish something...there was no motivation. It was just—there was absolutely no phrasing of a useful question other than trying to get it published.”

4.3.2 Living out ethos

The most substantial way the postdoc externalized ethos was by living it out in their own personal life, pursuing it in their daily life and having their work reflect their personalized values. They articulate how they live out the ethos by expressing how much they desire their values and how they enact it in their work.

Curiosity and passion for research is a constant motivator for many postdocs. Brandon, the Australian physicist, says “I want to be able to find out how things work” and loves that “people pay you just to come up with ideas and do stuff.” Michael, an American environmental scientist who is now an Assistant Professor, said about his work, “I get to ask questions and do cool things...I get to learn everyday.”

Brandon chose to return to research after a brief stint in banking because he felt he had more positive impact in science: “I feel like I’m doing something good as well that has more intrinsic value than, say, when I was working at the bank and kind of making money for rich people. Yeah I think this is better.” It was important to Brandon to be in a profession that allowed him to live out his ethos.

The postdocs also live up to the ethos of integrity in their research. Chris describes: “I really want to convince myself first before trying to convince others about my results” and doesn’t care to publish if he doesn’t feel his results are right. He had found his supervisor’s way “very sloppy.” He says, “So that’s why I did research and did it more carefully and got, of course, more results, more unexpected results.” Peter similarly talks about how he continuously recalibrated an oxygen sensor he had designed despite his supervisor’s pressure to publish after the first calibration. “I’m very hard on myself. I need to feel like I’m making forward progress.”

The postdocs clearly pursue ethos not for external recognition or compensation, but because of their own personal values. Living out ethos is continuous affirmation of their conviction and the kind of scientist they aspire to be.

4.3.3 Proselytizing Ethos

While the goal of living out ethos was for the self and one's own work to reflect the ethos, postdocs were also motivated to proselytize ethos and influence the behavior of others who they saw as deviating from ethos. Since postdocs lack the status and resources to engage in broad changes, opportunities for proselytizing are limited and yet postdocs find ways to create positive change.

Peter proselytizes the ethos of integrity to graduate students who he found was removing data and eliminating outliers: "I let them know that I think what they're doing is incorrect and how they should be approaching it". Peter has witnessed less-than-quality research being published, but for himself he enforces a strict research protocol and uses his position as a more experienced researcher to guide students to do the same. Peter also plans for future proselytization by envisioning the scientist he aspires to be. During his postdoc, he felt that it took a while for him to get oriented to his project because of the lack of communication and collaboration in his lab, and so for his own lab in the future: "I would really build a strong bridge between the current students and postdocs." Peter is building on his own experiences to shape the future scientist he wants to become.

When Paul first came into his postdoc, he felt the environment among researchers to be competitive in a destructive, cutthroat way partly because they were competing for access to one particular equipment. He describes, "the system...bred conflict right in. It was baked into the very model...So any time there was a hiccup or a screw-up, you know, people would—tempers

would flare up, there'd be fighting, it was terrible." Six months into his postdoc, Paul decided to enforce shifts based on a priority schedule. The difference was "you have to communicate your needs effectively and you have to trust the other person. And likewise they have to trust you. So collaboration and mutual trust and respect is baked into the system." He described how others supported his idea and how the system changed the culture in the department.

Michael feels that he avoided escalating conflicts with his supervisor by constantly communicating with him, despite the temptation on both ends to avoid confrontation, a lesson he learned from his graduate studies. He describes "I made a point to talk to my advisor more often...And even at the time when things were frustrating, we both worked very hard to work together. And I appreciated that. Because it could have been very bad very easily." He knew that "the less that I would talk to him the worse that would get...And that would make things fester...And I had seen really, really terrible relationships with [other postdocs and] their supervisors...at the very least I did not want that." Because of the negative relationships he experienced that resulted from a lack of communication, Michael made conscious effort to actively communicate and collaborate in a positive way with his supervisor even through frustrating circumstances.

Table 4: Externalization of Ethos

Ethos as Basis of Evaluating Life	Positive Evaluations	<p>"I've been kind of like pleasantly surprised by how, you know, involved everyone is in the group."</p> <p>"I have had advisors that were very focused on quality. There was a pressure to publish because they needed to. But the pressure to publish good quality sound science. [My supervisor] would never publish something before they knew that it was good and had been tested and was right."</p>
	Negative Evaluations	<p>"The lab is not super collaborative...But I would say in terms of, you know, professional engagement and interaction and scientific kind of discovery, I would say it was pretty minimal beyond kind of the daily, hi, how it's it going...I would say not so much long and epic debates on how a project could be improved."</p> <p>"I don't really see the people doing environmental science here, at least my supervisor, that they would really want to make the world a better place, I don't see that. So I am a bit disappointed."</p>

career as well as daily life constraints must be carefully negotiated with significant others, to the extent that the scientific career becomes a joint project between partners. Consideration of significant others' preferences, feelings and well-being often factored into the postdocs' career decisions. Peter and Chris both took their postdoc in order to be closer to their significant others' but this was the exception to the norm. Most postdocs relied on their spouse's support and sacrifice to be able to pursue their career while keeping their family together. In many cases, significant others' experiences and preferences impacted the way the postdocs considered their next career move. As a majority of the interviewees are foreign-born, many described the difficulty of adjusting to a new country particularly for their partners. Luke described how he rejected an offer he preferred because of his wife's reluctance to move and his continuous uncertainty about whether he would stay in his current position because of his wife's difficulty adjusting. Brandon returned to his home country in Australia following his postdoc in the States because of his wife's desire to return.

Table 5: Impact of Family and Significant Other's on Postdoc's Career

<p>Impact of family on postdocs' career</p>	<p>"It just requires too much time away from home. I missed too much in terms of what was going on at home. I was away when my wife had to take an ambulance to the hospital...it's like I missed those things and I wasn't there to—'cause I probably would have taken her to the hospital two days earlier...all those things that you wish could have done and I wasn't there" (<i>Took a position at a teaching focused college for family</i>)</p> <p>"Yeah, I saw pictures of [Madison] at least, yeah. I like that place. But, yeah, my wife wasn't happy to go." (<i>Rejected offer for spouse's preference</i>)</p> <p>"That's a lot of stress...Not only myself, my wife. She's kind of supporting my career, so I think at least for now it's time to find a break. Get a break of that tension." (<i>Exiting profession due to burnout and family stress</i>)</p> <p>"[My wife] was not always comfortable just being in the States...Louise particularly missed her family a lot more than maybe she was expecting as well." (<i>Returned to home country for spouse's preferences</i>)</p> <p>"I applied [to the postdoc] because I was planning on moving to Los Angeles to be with my wife, and this seemed like the best fit for what I wanted to do."</p> <p>"See in the case [my partner] stayed-- would have stayed in Vienna, I probably would have stayed in Vienna too." (<i>accepted postdoc to be with significant other</i>)</p>
--	--

Significant others, whether married or in long-term relationships, parents and non-parents, believe their role is to support their postdoc partner, however this role often comes at a high cost and with many challenges. The struggles that significant others face for the sake of their partner often represent the emotional investment they have in their partner's career, which was shown in three distinct ways: emotional support, pride and sacrifices (See Table 5).

Significant others offer *emotional support* to their husbands in three ways: listening, mirroring emotions and offering encouragement. Despite the highly technical nature of the postdoc's work, significant others believe that by simply listening to their partners about their work helps relieve stress, while involving their partners in the reality of their work life. Partners often mirror the postdoc's emotions, feeling happy and frustrated along with their partners, which demonstrates empathy as an important part of emotional support. Partners also actively encourage their partners through the difficulty of scientific research.

Partners showed *pride* in the postdoc's profession. Their admiration and respect are infused in the emotional support they give to their partners despite the challenges of the postdoc lifestyle. Their pride also indicates that the partners share in the postdoc's achievements and successes and views the career as a joint project.

The significant others' commitment to their partner's career is clearly shown by the personal *sacrifices* they make for their partners. All postdocs except one had made a significant geographical move, requiring spouses and partners to resign from previous jobs. While few spouses were able to find new employment, most international postdocs lacked the permit to work while others opted to take time off for their young children. The partners viewed the impact to their own career as a sacrifice for the sake of the postdoc's career. Carrie, a banker from

China, explains of her job change that “it was for him”. Their motives were varied, whether they were investing in the career with better financial prospects or supporting their partners’ passions.

Table 6: Role of Significant Others

Categories	Quotes
<p>Emotional support</p> <p>Listening</p> <p>Mirroring emotions</p> <p>Encouraging</p>	<p>“He talks to me not a lot what he is doing...we are coming from different backgrounds. But he will talk to me a lot about his feelings, like, when he is happy. When he feels frustrated, he will just talk to me.”</p> <p>“I listen to him, I would say. When he needs to talk, like, when he wants to talk about science or some findings that he had and I—then I try to, like, critically ask questions about it to gain some knowledge, to have a conversation with him.”</p> <p>“Whether he wants to be, who he wants to be, what achievement he wants to get, I just feel happy if he is happy.”</p> <p>“It’s a very coveted postdoc. Very few graduate students qualify for a federal lab postdoc. So we’re both excited when he got it.”</p> <p>“So most of the time he will fail...and he will feel very frustrated...I just need to encourage him and just telling him it’s okay. Research is like this. You cannot expect every time to be successful. And then you will win the Nobel award.”</p> <p>“I try to kind of support her in a sense...by motivating her and also saying that it’s not her fault...I would say 90 percent of the time, you’re kind of not successful in the thing you’re doing.”</p>
<p>Pride</p>	<p>“I’m proud of him. He is a smart guy. Nobody, even of my friends they will just stop at PhD. He is only one of the few who continues to do research...just like hanging there to do what he enjoys. He doesn’t care about the salaries. He doesn’t care about the other stuff. He just enjoys what he’s doing.”</p> <p>“I knew this is a big deal. I was very proud of him...He’s a smarty-pants.”</p> <p>“I’ve always been really proud of him and it’s really cool to say that your husband is a physicist...oh, he’s smart, he’s a rocket scientist, you know. So he’s actually a scientist like that. It makes a huge impression on people. So that’s always fun.”</p>
<p>Sacrifices (Career, moving, personal)</p>	<p>“I think is a little bit [sacrifice]... I am doing this for him. If he is not moving here, I probably will working [at the previous job] for a long—much longer than one year.”</p> <p>“I had to resign from my job. I would have done it anyway because I became a mom. I wanted to stay home with [my daughter] for at least a year. But I lost a job. I lost a lot of friends.”</p> <p>“He will be put into the most important career life and I will be the follower, yeah.”</p>
<p>Challenges</p>	<p>“Starting the relationship with him, I feel a little bit not comfortable with this, with his work and life balance...so I would feel frustrated. But right now...[I’m] just trying to learn to understand him, understand his job.”</p> <p>“I considered myself at the time a postdoc widow. He was working weekends sometimes as well. We had to discuss it. We had to talk about that...I was very frustrated. I was a little bit resentful...so the beginning was challenging...by the time we left I adored [the city] and I regretted leaving” (referring to a new job)</p> <p>“So I’m thinking if I was in Georgia there is a bigger chance that my career would have evolved. And who knows what I would have achieved, I don’t know...But I can’t really say it was a sacrifice or not. ‘Cause I gained a lot of other opportunities.”</p>
<p>Future</p>	<p>“I think if we do go now we may lose that momentum that he has in his career and it will be more difficult...he’ll have to start from the beginning sort of, so I don’t want to lose that momentum. On the other hand I do want my kids to be exposed to Georgian culture.”</p>

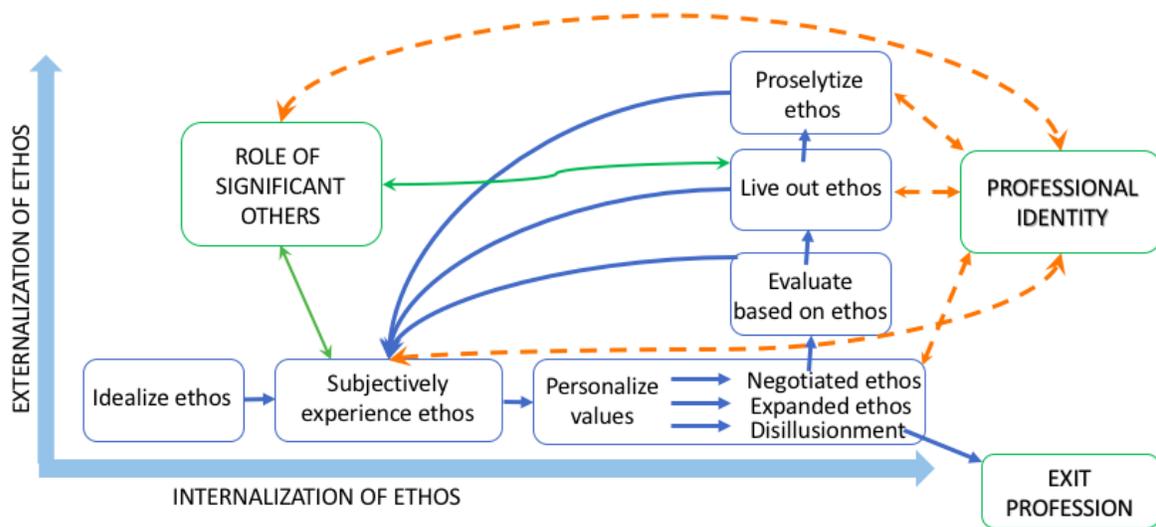
5 A model of professional identity construction as a dialectic of institutional ethos and subjectivity

From the higher order categories, I developed a process model shown in Figure 1 of how professional identities are developed. The categories were first organized as inward-directed (idealizing, subjectively experiencing and personalizing values) or outward-directed (evaluating, living out ethos and proselytizing ethos). The categories were organized on an x-y axis to represent the progressive internalization and externalization of ethos that together play into professional identity construction.

“Idealizing ethos” at the intersection of the axes represent a logical starting point when postdocs first enter into their appointment, and where internalization and externalization of ethos is at its lowest. Ethos is articulated as abstract and simplistic ideals, and postdocs have not yet had the opportunity to enact their professional identities in the workplace outside of educational settings.

Ethos becomes progressively internalized through subjective experiences which lead to personalization of ethos values. Personalized values include disillusionment of the scientific career, potentially leading to exiting the profession, expanding one’s understanding of ethos, or reaching a negotiated understanding of ethos, the latter two enabling postdocs to begin constructing professional identity in terms of sense of self and meaning-making. Disillusionment and exiting of career occurs not from failure to internalize values, but on the contrary, signifies a strong internalization of values that fuels a perception of value violation in the workplace. Exiting the profession is often preceded by an inability to resolve these contradictions internally in addition to a perceived alternative in a different profession.

Figure 2. Process Model of Professional Identity Construction



Personalized values signifying a strong internalization of ethos enable postdocs to externalize ethos progressively by evaluating others based on their values, living out and enacting their ethos, and proselytizing ethos. Though I use term “values”, as in personalized values, to signify the modification of ethos through personal experience, I use the term ethos in the externalization process to emphasize the connection to the institutional ethos, despite personalization, because of its significance as institutional work—reproducing and maintaining the institution.

Each of the externalization of ethos feeds back into subjective experiences, producing emotional experiences and continuous reinforcement of personalized values, as well as the potential to change personalized values due to unexpectedly different experiences.

The dashed reciprocal arrows show theoretical relationships to professional identity development from subjective experiences, personalized values, living out ethos and proselytizing ethos. Personalized values indicate full internalization of ethos but also a fusing of ethos with personal values making contributing to an internal sense of self. Living out ethos is a powerful

outward affirmation of one's identity reflected in daily work and social interactions. Living out ethos then feeds back into subjective experiences where emotions, and the appropriateness of the emotions, provides further confirmation of the authenticity of one's identity.

The role of significant others is shown in the model to impact subjective experiences of postdocs and the way postdocs enact their professional identity. The pursuit of the scientific career path is generally enabled, for this sample, by the support and sacrifices of their partners. Significant others also become an important factor in both the decision to accept the postdoc and subsequent career moves. Postdocs' subjective experience is highly affected by work-life balance which depends on their partners. Partners offer emotional support and encouragement and affirm the postdocs' professions through pride in addition to material support (child-rearing, household responsibilities) and personal sacrifices (career and education). The partners' well-being or struggles colors the experiences of the postdocs who are highly in-tune to their partners. Reciprocally, significant others are affected by the subjective experiences of postdocs, who share their experiences with their partners. Partners come to mirror the emotions of the postdocs, sharing in the struggles and highlights of the profession.

The current work puts forth the theoretical link between the role of significant others and professional identity, as an under-examined, yet societally and institutionally significant aspect of professional identity. Significant others can have immense influence on one's career as enhancing, enabling, constraining, or blocking the path to professional success. The institutions of profession and family have been inextricably linked as to produce parallel patterns of gender throughout history. Particular to this sample, as further work is needed to test the generalizability of this finding, professional identity reciprocally influences the identity of the significant others. As many partners quit their jobs and leave their homes to follow their postdoc partners to a new

country, both partners together invest their resources into one career path which then becomes a dominant and shared characteristic of the home and relationship.

6 Discussion

The motivation for this study was to explore the subjective experiences of professional identity development to better understand how people become emotionally invested into the institutional order, and how such attachment is maintained on an ongoing basis. Previous literature has based such professional identity on cognitive and discursive processes and from an in-role perspective that describes the process as seeking increasingly closer alignment between one's work and self-conception. While this process is dynamic and requires active reflection and participation on the part of the professional, it is often linear and predictable. Most notably, literature often posits the opposite of professional identity development to be a failure to identify (Elsbach & Bhattacharya, 2001; Pratt et al., 2013), which would predict that those who exit the scientific profession are less committed to the scientific ethos. Through this study however, I have found that those who leave are equally, if not more, committed to and identify with scientific ethos.

The focus on emotions and ethos reveals a much more problematic and even tumultuous identity development that requires ongoing management of one's identification with the profession. The challenge is not to maintain identification with the scientific ethos, which remains unwavering through its evolutions, but to resolve the tension that arises between experience and ideals so that the professional, in their commitment to their ideals, remains in the profession. It is not the failure of identification with the professional ethos that leads to exit, but strong identification to ideals that leads to disillusionment and ultimately exit.

The main theoretical contribution lies in specifying the mechanisms of this interlevel relationship between institutional ethos and individual-level professional identity involving a top-down, internalization and subjectification processes as well as a bottom-up enactment of institutional ethos. The data shows the postdoctoral period to be a time of formative challenges and intense emotional experiences that reveal professional identity as highly unstable and fragile. Postdocs, though committed to the scientific ethos, are uncertain about their future career in science for a variety of reasons. The job market for permanent positions is dismal, and there is mounting pressure to perform and publish. Postdocs are uncertain of their ability to perform under such stakes, and equally as uncertain about their desire to continue in such competitive conditions. Postdocs use the period to test out their career, evaluate their own abilities to keep up and gauge their overall satisfaction in the path to project the viability of their career for their lives. Many keep an eye out for alternative careers in industry, and in the end, some drop out of the scientific career altogether. Under such uncertainty about one's own path, postdocs only enter with partially formed professional identities that undergo evolution and maturation throughout the postdoc, hence the "in-between" professional.

6.1 Maintaining ongoing identification

The most significant times of professional identity development as well as identity management occurs in the stage of personalization of values and living out ethos. Strong emotions during the subjective experience stage causes postdocs to reflect on the ethos many of which occur because of value conflicts and value violations. When ethos ideals are perceived to be violated, emotions of frustration and disappointment arise. Because these violations are committed by other scientists or supervisors or stems from the organization or scientific

institutions (funding bodies, scientific societies, publishing committees), whom the postdocs expect to uphold the values, the postdocs experience a conflict between their ideals and their experiences. Scientific values become essentially decoupled from scientific practice. Through their emotions and reflection, postdocs seek to resolve the tension by expanding their understanding of ethos, negotiating their understanding of ethos, or else become disillusioned. Through these processes, the once abstract ideals of the ethos become personalized, as it is embedded in lived experience with all its idiosyncrasies and nuances.

The socialization literature show how organizations mold individuals to preferred identities, through discourse (Alvesson, 2002), sensebreaking and sensemaking (Pratt, 2000), while the literature on identity construction and identity work examine the agency of people in actively co-constructing identity along with the organizational and managerial initiative (M. Anteby, 2008; Endrissat et al., 2016; Ibarra, 1999), however these works assume people eventually don the preferred identities as is, overlooking the *shift* in the preferred identity and values that occurs through experience. In the case of the postdocs, their understanding of ethos changed through experience, specifically becoming personalized, and it was to these personalized values (expanded and negotiated) that they aspired to embody and come to define themselves with.

Expanded understanding of ethos is when new meaning is added to the original ethos ideals, and personal values are fused with ethos values. For example, while collaboration was originally articulated as helping to progress science, experiences of isolation lead postdocs to value collaboration for its emotional support and community. The conflict between ideal and experience arises only because the ideal lacks lived experience and is relatively easy to resolve simply by expanding their understanding of ethos as well as deepening the meaningfulness of

ethos for their professional identity. The expanded meaning of ethos also intensifies the motivation of the postdoc to pursue ethos in their work, not only because they are ideal for science but the meaning it has on their personal experiences.

Negotiated understanding of ethos occurs when conflict between ideal and experience is more direct. Postdocs reflect on why the conflict occurs and prompts them to reconsider their values as well as understand the motivation of those they perceive to have violated the ethos. The postdocs craft an understanding that rationalizes the occurrence but without discarding the ideals. The rationalization and negotiating their understanding of ethos help the postdocs cope with the initial emotions of frustration and disappointment. Elements of the ideal remains but in full acknowledgement of the tension, therefore the ethos is negotiated between the ideal and the experience. The rationalization in a way protects the ideals from the realities that the postdoc experiences, and in a way protecting the postdoc from disillusionment.

The personalization of values, both in expanding and negotiating understanding of ethos, clearly reveals the internal struggles of the postdocs in maintaining their identification with the profession. Ethos violations causes emotional micro-trauma and compels postdocs to rethink their profession, the meaning they had originally attached to their profession, and their role as a professional member. Through expanding and negotiating their understanding, postdocs are processing the experience of value violation and incorporating it into their maturing understanding of their profession, yet artfully retaining components of their ideals, values and meaning so that the profession continues to define who they are and provide meaning for their work.

The instability and fragility of this identification is clearly evident given that not all postdocs continue with their profession. While literature has documented disidentification, or the

failure to identify as contributing to organizational turnover and exiting the profession, (Elsbach & Bhattacharya, 2001; Pratt, 2000), this study shows that, contrary to disidentification, strong identification potentially leads to increased likelihood of perceiving hypocrisy and experiencing disappointment. When perceived value violation and associated emotions are severe, and no resolution is reached through expanding or understanding, the postdocs instead become resigned to disillusionment. The postdocs reach an understanding that the ethos cannot or will not be upheld in the profession. Combined with their perceived lack of power and influence to affect any change, the ideals become an unattainable fantasy rather than goals. Still these postdocs exhibit steadfast commitment to the scientific ethos, no less than those who remain in the profession, but choose to live out their values in alternate careers. Even in these non-scientific careers, the postdocs envision themselves retaining their scientific identity and values in these careers. For these postdocs, scientific values take priority over scientific career.

For the postdocs who choose to stay and continue with their scientific career, internal maintenance of identification is further solidified by living out and enacting ethos. The postdocs articulate how they desired their work to reflect ethos in their daily work. The pursuit of ethos is not to conform to external criteria nor does it require an audience or evaluator other than themselves. Externalizing their values confirm their professional identity to themselves, and associated subjective experiences, emotions and reflection further reinforces professional identity.

The importance of enacting ethos so that one's behavior is consistent to one's values is perhaps the reason disillusioned postdocs choose to leave the profession. To continue in a career where one believes ethos cannot be upheld leaves conflict between values and action unresolved,

and can lead to disengagement, feelings of inauthenticity and even hypocrisy. Postdocs exit the profession to escape the conflict and choose a career where they can stay true to their values.

This work extends theory on professional identity work or institutional work that is triggered by identity threats or violations of expectations. In Pratt, et. al.'s 2006 study, medical residents are motivated towards identity work through work-identity integrity violations, and similarly, Wright, et. al.'s 2017 emergency room doctors experience value conflicts with specialists that spur institutional work. Scholars have recognized the potential for conflicts, whether institutional logics, identity, or values, to lead to awareness beyond institutional arrangements and allow for novel solutions (Battilana et al., 2009; Dunn & Jones, 2010; Seo & Creed, 2002). Conflict does not always lead to positive problem-solving, however, and the mechanism underlying the success or failure to resolving conflicts are underexplored. In this study, experiences of value violation lead to a decoupling of values with practice and the failure to identify with profession is partially due to the inability to reconnect values with practice.

6.2 Ethos-values-morality and identity

I began with the theorization of emotions in institutional theory and its connection to the institutional ethos to understand how emotions form professional identity and connects the individual to the profession. This lead to a focus on ethos as morality and the centrality of values in professional identity. Hitlin (2016) had explicated values to be a cohesive force for personal identity. Values are trans-situational and can govern both social and non-social behavior, and can give a sense of consistency and wholeness to people who constantly traverse diverse situations, roles, and environments. For professional identity however, the role of values as a centralizing force has been less examined.

The postdocs, when asked “What does it mean to be a scientist” often answered in terms of broad values that echoed scientific ethos, such as one who is motivated by curiosity, one who follows the scientific method (integrity), etc. While scientific activity and scientific learning and thinking all contribute to professional identity, it is the upholding of values that hold much meaning and are intimately tied to emotions.

Ethos emphasizes the institutional origins of these values, as shown by the secondary data, and its disciplinary power as it takes on a moral character. More than “ideals worth striving for” (Hitlin, 2016), morals define goodness and badness and becomes part of one’s subconscious and personhood. This may partially explain why morals are so intimately tied to emotions and affect, inspiring feelings of pride and shame (Creed et al., 2014) and certain moral emotions as identified by Wright et. al. (2017) such as others-condemning and other-suffering. The moral character of ethos values become apparent in the way postdocs evaluated others based on ethos as a criterion. Postdocs evaluate failure to uphold ethos not only as scientifically unproductive but bad in itself, leading to feelings of disappointment and disgust.

6.3 The Role of Significant Others

The role of significant others in the professional identity literature and institutional actorhood has to date been underexplored. Berger and Luckmann (1966) had briefly theorized on the role of significant others in maintaining subjective reality by participating and confirming objectivated reality. Our data suggests unexpected findings regarding significant others that is more expansive and critical to the professional identity development of the postdocs.

Their role as a long-term partner or spouse of a postdoc often included emotional as well as logistical support as is typical of long-term relationships, notwithstanding cultural, religious

and gender variations, but in the case of postdoctoral spouses and partners, such support came at a high cost. Spouses moved for their partners' temporary positions, leaving behind careers, family, and social networks, and for international postdocs, their native culture and language. Because of the temporary nature of the postdoc and the anticipation of another near-future move, many partners were unable to restart or develop their careers. Many postdocs also start families around this time, and the burden of child-rearing and home management often fell on the partners and spouses unequally. But without such support, postdocs would not be able to resolve and maintain both their career and family lives. In the case of postdoctoral scientists, professional development relied heavily on family support and sacrifice.

The synergy between the professional and family domain makes a theoretical contribution for both institutional theory and professional identity literature. In the meta-theory of institutional logics, multiple logics are often viewed in terms of conflict (Friedland & Alford, 1991; Seo & Creed, 2002) leading to change and negotiation (Battilana et al., 2009; Bechky, 2011), and in other cases, co-existence and plurality of logics that can be either stable or unstable (Kraatz & Block, 2008; Reay & Hinings, 2009; van Gestel & Hillebrand, 2011). Institutional synergy on the other hand describes a case in which disparate institutions strengthen one another. In the case of postdocs, the institution of family that mandates unconditional love and support enables the institution of the profession for the early professionals.

Conversely, we would expect to see the institution of the profession strengthening that of family. One example is the ability to support one's family financially, an urgent and even sacred duty for heads of households and a very real concern for low-paid postdocs. But more importantly, we examine the effect of the profession on significant others who shared pride and the sense of accomplishment with their partners. To analyze this in further detail, we found that

partners through their sacrifices and support have personal stake and investment in their partner's scientific career. Their contributions have made their partner's success partially theirs, and in participating in the emotional experiences connected to the profession imparts a sense of identity all its own. Several spouses referred to themselves as "postdoc wives", and another a "postdoc widow" in reference to her husband's long hours at work. The possibility of professional identity colonizing the identities of significant others contributes to the literature of professional identity by expanding the notion of identity as relational and interactional. In this study of postdocs, confining professional identity to in-role, or interactions directly related to work would miss the critical emotional and personal dynamics that seal professional identity.

This work therefore furthers the notion of professional identity as centralized especially for highly committed and passionate professionals. The centrality of the profession in the postdocs' life is clear: years of education and financial hardship, and significant geographical, often international, mobility. Internally, professional identity remains salient outside of work. Postdocs problem-solved in daily life with the rigor of the scientific method, exhibited high curiosity in all things outside of science, and believed themselves to be better parents and spouses because of their profession. Postdocs mentioned their spouses and children often and how their careers have affected their lives, and how they hope their future career will affect the future of the family. Professional identity encompasses not only what professionals do at work, but how it affects other areas of their lives and the people in it. This study contributes to the idea that passionate professionals' identities can be all-encompassing beyond the in-role identity.

6.4 Limitations

Several limitations of this work are important to note in order to understand the boundary conditions of the process model and findings. The study relies on interviews but could benefit from ethnographic support, such as in-person observations. Interviews only access emotions and episodes that are salient to the interviewee, and data is dependent upon the questions asked. Direct observations however would allow recording of work and social interactions and in-situ emotions that may escape the conscious attention of the professional.

The study is also cross-sectional rather than longitudinal. While the postdocs who were interviewed were in different stages of their appointment and careers, temporal progression in changes to professional identity were deduced from single interviews making it difficult to understand exactly when certain changes occurred. A longitudinal study that tracks the postdocs over a period of time can capture more accurate data on the before and after effects of the postdoctoral appointments.

7 Conclusion

This study explores the profession as a calling. The modern generation demands more from work than earning a paycheck and establishing economic security, but seeks enjoyment and fulfillment. Connecting professional identity to institutional theory, and particularly institutional ethos reveals interlevel dynamics that infuse professional work with meaning and sense of identity. The emotional lens highlights the role of values in identity processes and helps further the notion of a centralized identity that is made coherent through trans-situational values. Considering emotions also brings researchers closer to the personal lives of the subjects and reveals the highly dynamic and at times unstable process through which professional identity

solidifies and people become institutionalized. An intimate look at the lived experiences of postdocs reveal a highly purposeful negotiation of ideals and experiences through which commitment to the profession is maintained.

The significant others' profound role in postdoc's journey as a professional remind us of the wholeness and the humanness of these institutional actors under study. That the professional institution is invisibly supported by the family institution is an important area of research that needs further theorization as well as empirical investigation. Professional identity development is after all a journey that is meaningful not only to the new professional but to the significant others who in their love and support also commit to the profession from their unique positions.

References

- Abbott, A. (1988). The system of professions: An essay on the division of labor.
- Åkerlind, G. S. (2005). Postdoctoral researchers: roles, functions and career prospects. *Higher Education Research & Development*, 24(1), 21–40. <https://doi.org/10.1080/0729436052000318550>
- Alvesson, M. (2002). Identity Regulation as Organizational Control: Producing the Appropriate Individual. *Journal of Management Studies*, 39(5), 22–2380. <https://doi.org/10.1111/1467-6486.00305>
- Anteby, M. (2008). Identity Incentives as an Engaging Form of Control: Revisiting Leniencies in an Aeronautic Plant. *Organization Science*, 19(2), 202–220. <https://doi.org/10.1287/orsc.1070.0343>
- Anteby, M., Chan, C. K., & DiBenigno, J. (2015). Three Lenses on Occupations and Professions in Organizations: Becoming, Doing, and Relating*. *The Academy of Management Annals*, 10(1), 183–244. <https://doi.org/10.1080/19416520.2016.1120962>
- Aquino, K., & Americus, R. (2002). The self-importance of moral identity. *Journal of Personality and Social Psychology*, 83(6), 1423–1440. <https://doi.org/10.1037//0022-3514.83.6.1423>
- Ashforth, B. E., & Schinoff, B. S. (2016). Identity Under Construction: How Individuals Come to Define Themselves in Organizations. *Annual Review of Organizational Psychology and Organizational Behavior*, 3(1), 111–137. <https://doi.org/10.1146/annurev-orgpsych-041015-062322>
- Barley, S. R. (1989). Careers, identities, and institutions: The legacy of the Chicago School of Sociology. *Handbook of Career Theory*, 41, 65.
- Battilana, J., Leca, B., & Boxenbaum, E. (2009). How Actors Change Institutions: Towards a Theory of Institutional Entrepreneurship. *The Academy of Management Annals*, 3(1), 65–107. <https://doi.org/10.1080/19416520903053598>
- Bechky, B. A. (2011). Making Organizational Theory Work: Institutions, Occupations, and Negotiated Orders. *Organization Science*, 22(5), 1157–1167. <https://doi.org/10.1287/orsc.1100.0603>
- Berger, P. L., & Luckmann, T. (1966). The social construction of reality. *Penguin Group*, 249. <https://doi.org/10.2307/323448>
- Chen, S. H., McAlpine, L., & Amundsen, C. (2015). Postdoctoral positions as preparation for desired careers: a narrative approach to understanding postdoctoral experience. *Higher Education Research & Development*, 34(6), 1083–1096. <https://doi.org/10.1080/07294360.2015.1024633>
- Chreim, S., Williams, B., & Hinings, C. (2007). Interlevel influences on the reconstruction of professional role identity. *Academy of Management Journal*, 50(6), 1515–1539. <https://doi.org/10.5465/AMJ.2007.28226248>
- Corley, K. G., & Gioia, D. a. (2004). Identity Ambiguity and Change in the Wake of a Corporate Spin-off. *Administrative Science Quarterly*, 49(2), 173–208. <https://doi.org/10.2307/4131471>
- Creed, D. W. E., Hudson, B. A., Okhuysen, G. A., & Smith-Crowe, K. (2014). Swimming in a Sea of Shame : Incorporating Emotion Into Explanations of Institutional Reproduction and Change, 39(3), 275–301. <https://doi.org/10.5465/amr.2012.0074>
- Creed, W. E. D., DeJordy, R., & Lok, J. (2010). Being the change: Resolving institutional contradiction through identity work. *Academy of Management Journal*, 53(6), 1336–1364. <https://doi.org/10.5465/amj.2010.57318357>
- DiMaggio, P. (1988). Interest and agency in institutional theory. *Institutional Patterns and Organizations Culture and Environment*, 3–21.

- Dumas, T. L., & Sanchez-Burks, J. (2015). The Professional, the Personal, and the Ideal Worker: Pressures and Objectives Shaping the Boundary between Life Domains. *The Academy of Management Annals*, 9(1), 803–843. <https://doi.org/10.1080/19416520.2015.1028810>
- Dunn, M. B., & Jones, C. (2010). Institutional Logics and Institutional Pluralism: The Contestation of. *Administrative Science Quarterly*, (55), 114–149. <https://doi.org/10.2189/asqu.2010.55.1.114>
- Elsbach, K. D., & Bhattacharya, C. B. (2001). Defining Who You Are By What You're Not: Organizational Disidentification and The National Rifle Association. *Organization Science*, 12(4), 393–413. <https://doi.org/10.1287/orsc.12.4.393.10638>
- Endrissat, N., Karreman, D., & Noppeney, C. (2016). Incorporating the creative subject: Branding outside-in through identity incentives. *Human Relations*, 1–28. <https://doi.org/10.1177/0018726716661617>
- Fayard, A.-L., Stigliani, I., & Bechky, B. A. (2016). How Nascent Occupations Construct a Mandate. *Administrative Science Quarterly*, 183921666580. <https://doi.org/10.1177/0001839216665805>
- Fraher, A. L., & Gabriel, Y. (2014). Dreaming of flying when grounded: Occupational identity and occupational fantasies of furloughed airline pilots. *Journal of Management Studies*, 51(6), 926–951. <https://doi.org/10.1111/joms.12081>
- Friedland, R. (2017). Moving institutional logics forward: Emotion and meaningful material practice. *Organization Studies*, 170840617709307.
- Friedland, R., & Alford, R. R. (1991). Bringing society back in: Symbols, practices and institutional contradictions.
- Glynn, M. A. (2000). When Cymbals Become Symbols: Conflict Over Organizational Identity Within a Symphony Orchestra. *Organization Science*, 11(3), 285–298. <https://doi.org/10.1287/orsc.11.3.285.12496>
- Glynn, M. A. (2017). Theorizing the Identity–Institution relationship: Considering Identity as antecedent to, Consequence of, and Mechanism for, Processes of Institutional Change. *The SAGE Handbook of Organizational Institutionalism*, 243.
- Goodrick, E., & Reay, T. (2010). Florence nightingale endures: Legitimizing a new professional role identity. *Journal of Management Studies*, 47(1), 55–84. <https://doi.org/10.1111/j.1467-6486.2009.00860.x>
- Greenwood, R., Oliver, C., Sahlin-Andersson, K., & Suddaby, R. (2008). *Sage Handbook of Organizational Institutionalism*. Sage.
- Greenwood, R., Suddaby, R., & Hinings, C. R. (2002). Theorizing change: The role of professional associations in the transformation of institutionalized fields. *Academy of Management Journal*, 45(1), 58–80. <https://doi.org/10.2307/3069285>
- Hallett, T., & Ventresca, M. J. (2006). Inhabited institutions: Social interactions and organizational forms in Gouldner's Patterns of Industrial Bureaucracy. *Theory and Society*, 35(2), 213–236. <https://doi.org/10.1007/s11186-006-9003-z>
- Hardy, C., & Maguire, S. (2008). Institutional entrepreneurship. *The Sage Handbook of Organizational Institutionalism*, 1, 198–217.
- Harrison, S. H., & Wagner, D. T. (2016). Spilling Outside the Box: the Effects of Individuals' Creative Behaviors At Work on Time Spent With Their Spouses At Home. *Academy of Management Journal*, 59(3), 841–859. <https://doi.org/10.5465/amj.2013.0560>
- Heinze, K. L., & Weber, K. (2015). Toward Organizational Pluralism: Institutional Intrapreneurship in

- Integrative Medicine. *Organization Science*, (April 2017), orsc.2015.1028.
<https://doi.org/10.1287/orsc.2015.1028>
- Hitlin, S. (2016). Values as the Core of Personal Identity : Drawing Links between Two Theories of Self. *Social Psychology Quarterly*, 66(2), 118–137.
- Hitlin, S., & Piliavin, J. A. (2004). Values: Reviving a Dormant Concept. *Annual Review of Sociology*, 30(1), 359–393. <https://doi.org/10.1146/annurev.soc.30.012703.110640>
- Ibarra, H. (1999). Provisional selves: Experimenting with image and identity in professional adaptation. *Administrative Science Quarterly*, 44(4), 764–791. <https://doi.org/10.2307/2667055>
- Ibarra, H., & Barbulescu, R. (2010). Identity As Narrative : Prevalence , Effectiveness , and Consequences of Narrative Identity Work in Macro Work Role Transitions, 35(1), 135–154.
- Ibarra, H., & Obodaru, O. (2016). Betwixt and between identities: Liminal experience in contemporary careers. *Research in Organizational Behavior*, 36, 47–64. <https://doi.org/10.1016/j.riob.2016.11.003>
- Kennedy, J. A., Kray, L. J., & Ku, G. (2017). A social-cognitive approach to understanding gender differences in negotiator ethics: The role of moral identity. *Organizational Behavior and Human Decision Processes*, 138, 28–44. <https://doi.org/10.1016/j.obhdp.2016.11.003>
- Kraatz, M. S., & Block, E. S. (2008). Organizational implications of institutional pluralism. *The Sage Handbook of Organizational Institutionalism*, 840, 243–275.
- Kyratsis, Y., & Phillips, N. (2017). Health Systems in Transition : Professional Identity Work in the Context of Shifting Institutional Logics. *Academy of Management Journal*, 60(2), 610–641. <https://doi.org/10.5465/amj.2013.0684.The>
- Lawrence, T. B., Leca, B., & Zilber, T. B. (2013). Institutional work: Current research, new directions and overlooked issues. *Organization Studies*, 34(8), 1023–1033.
- Marini, M. M. (2001). Social values and norms. *Encyclopedia of Sociology*, 4, 2828–2840. Retrieved from <http://find.galegroup.com/gic/infomark.do?&source=gale&eisbn=978-0-02-865899-5&idigest=fb720fd31d9036c1ed2d1f3a0500fcc2&prodId=GIC&userGroupName=itsbtrial&tabID=&docId=CX34044400361&type=retrieve&contentSet=EBKS&version=1.0>
- Merton, R. K. (1973). *The sociology of science : theoretical and empirical investigations*. Chicago : University of Chicago Press, 1973. Retrieved from <https://proxy.library.brocku.ca/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=catt00778a&AN=bu.b2000142&site=eds-live&scope=site>
- Meyer, J. W. (2010). World Society, Institutional Theories, and the Actor. *Annual Review of Sociology*, 36(1), 1–20. <https://doi.org/10.1146/annurev.soc.012809.102506>
- Meyer, J. W., & Rowan, B. (1977). Institutionalized organizations: Formal structure as myth and ceremony. *American Journal of Sociology*, 83(2), 340–363.
- Muzio, D., Brock, D. M., & Suddaby, R. (2013). Professions and institutional change: Towards an institutionalist sociology of the professions. *Journal of Management Studies*, 50(5), 699–721. <https://doi.org/10.1111/joms.12030>
- National Research Council. (2005). *Policy Implications of International Graduate Students and Postdoctoral Scholars in the United States*. National Academies Press.
- O’leary, Z. (2004). *The essential guide to doing research*. Sage.
- Oliver, C. (1991). Strategic responses to institutional processes. *Academy of Management Review*, 16(1), 145–179.

- Pache, A. C., & Santos, F. (2013). Inside the hybrid organization: Selective coupling as a response to competing institutional logics. *Academy of Management Journal*, 56(4), 972–1001. <https://doi.org/10.5465/amj.2011.0405>
- Powell, W. W., & Rerup, C. (2016). Opening the black box: The microfoundations of institutions. *The SAGE Handbook of Organizational Institutionalism*, 2.
- Pratt, M. G. (2000). The good , the bad , and the ambivalent : Managing identification among Amway distributors.
- Pratt, M. G., Rockmann, K. W., & Kaufmann, J. B. (2013). Constructing Professional Identity : The Role of Work and Identity Learning Cycles in the Customization of Identity among Medical Residents, 49(2), 235–262.
- Ramarajan, L., & Reid, E. (2013). Shattering the Myth of Separate Worlds : Negotiating Nonwork Identities At Work, 38(4), 621–644. <https://doi.org/10.5465/amr.2011.0314>
- Reay, T., Goodrick, E., Waldorff, S. B., & Casebeer, A. (2017). Getting leopards to change their spots: Co-creating a new professional role identity. *Academy of Management Journal*, 60(3), 1043–1070. <https://doi.org/10.5465/amj.2014.0802>
- Reay, T., & Hinings, C. R. (2009). Managing the Rivalry of Competing Institutional Logics. *Organization Studies*, 30(6), 629–652. <https://doi.org/10.1177/0170840609104803>
- Rothbard, N. P., Phillips, K. W., & Dumas, T. L. (2005). Managing Multiple Roles: Work-Family Policies and Individuals' Desires for Segmentation. *Organization Science*, 16(3), 243–258. <https://doi.org/10.1287/orsc.1050.0124>
- Scott, W. R. (2008a). Approaching adulthood: The maturing of institutional theory. *Theory and Society*, 37(5), 427–442. <https://doi.org/10.1007/s11186-008-9067-z>
- Scott, W. R. (2008b). Lords of the Dance: Professionals as Institutional Agents. *Organization Studies*, 29(2), 219–238. <https://doi.org/10.1177/0170840607088151>
- Seo, M.-G., & Creed, W. E. D. (2002). Institutional Contradictions , and Institutional Change : a Dialectical. *Management*, 27(2), 222–247. <https://doi.org/10.2307/4134353>
- Singer, M. (2000). Enhancing the postdoc experience. *Issues in Science and Technology*.
- Stryker, S., & Burke, P. (2009). The Past , Present , and Future of an Identity Theory Author (s): Sheldon Stryker and Peter J . Burke Source : Social Psychology Quarterly , Vol . 63 , No . 4 , Special Millenium Issue on the State of Sociological Social Psychology (Dec . , 2000) , pp . *Social Psychology*, 63(4), 284–297. <https://doi.org/10.2307/2695840>
- Suddaby, R., & Viale, T. (2011). Professionals and field-level change: Institutional work and the professional project. *Current Sociology*, 59(4), 423–442. <https://doi.org/10.1177/0011392111402586>
- Tajfel, H. (1974). Social identity and intergroup behavior, 65–93. <https://doi.org/10.1177/053901847401300204>
- Thatcher, S. M. B., & Zhu, X. (2006). Changing identities in a changing workplace: Identification, identity enactment, self-verification, and telecommuting. *Academy of Management Review*, 31(4), 1076–1088. <https://doi.org/10.5465/AMR.2006.22528174>
- Thornborrow, T., & Brown, A. D. (2009). “Being regimented”: Aspiration, discipline and identity work in the British Parachute Regiment. *Organization Studies*, 30(4), 355–376. <https://doi.org/10.1177/0170840608101140>
- Toubiana, M., & Zietsma, C. (2017). The Message is on the Wall ? Emotions , Social Media and the The

Message is on the Wall? Emotions, Social Media and the Dynamics of Institutional Complexity
Madeline Toubiana University of Alberta. *Academy of Management Journal*.

- van Gestel, N., & Hillebrand, B. (2011). Explaining Stability and Change: The Rise and Fall of Logics in Pluralistic Fields. *Organization Studies*, 32(2), 231–252. <https://doi.org/10.1177/0170840610397475>
- Voronov, M., & Vince, R. (2012). Integrating emotions into the analysis of institutional work. *Academy of Management Review*, 37(1), 58–81. <https://doi.org/10.5465/amr.2010.0247>
- Voronov, M., & Weber, K. (2016). The heart of institutions: Emotional competence and institutional actorhood. *Academy of Management Review*, 41(3), 456–478. <https://doi.org/10.5465/amr.2013.0458>
- Walsh, J. P. (2015). The impact of foreign-born scientists and engineers on American nanoscience research. *Science and Public Policy*, 42(1), 107–120. <https://doi.org/10.1093/scipol/sct084>
- Weber, K., Heinze, K. L., & DeSoucey, M. (2008). Forage for thought: Mobilizing codes in the movement for grass-fed meat and dairy products. *Administrative Science Quarterly*, 53(3), 529–567.
- Winterich, K. P., Aquino, K., Mittal, V., & Swartz, R. (2013). When moral identity symbolization motivates prosocial behavior: The role of recognition and moral identity internalization. *Journal of Applied Psychology*, 98(5), 759–770. <https://doi.org/10.1037/a0033177>
- Wright, A. L., Zammuto, R. F., & Liesch, P. W. (2017). Maintaining the values of a profession: Institutional work and moral emotions in the emergency department. *Academy of Management Journal*, 60(1), 200–237. <https://doi.org/10.5465/amj.2013.0870>
- Xu, Z. X., & Ma, H. K. (2015). Does Honesty Result from Moral Will or Moral Grace? Why Moral Identity Matters. *Journal of Business Ethics*, 127(2), 371–384. <https://doi.org/10.1007/s10551-014-2050-x>
- Yu, K., Kim, S., & Restubog, S. (2015). Transnational Contexts for Professional Identity Development in Accounting. *Organization Studies*, 36(11), 1577–1597. <https://doi.org/10.1177/0170840615593586>

Appendix A: Interview Protocol

Postdocs:

1. Background Information:
 - a. Department, Supervisor
 - b. What year of postdoc, whether it's first or second?
 - c. PhD- field
 - d. Country of origin
 - e. Family
2. Can you briefly describe your research project?
3. What does it mean to be a scientist for you?
4. How did you end up in this post-doc position?
 - a. Why did you decide to do a post-doc (or this specific postdoc)?
 - b. What did you expect from the post-doc?
5. In general, how has your postdoc experience been?
 - a. How does it align with or differ from your expectations?
 - b. What professional skills are you gaining through the post doc?
 - c. What are the biggest challenges related to work?
6. Describe your professional relationship with your supervisor.
 - a. What is the supervising style of your supervisor?
 - b. Does his/her style fit with the way you work?
7. Do you work with other postdocs? Do you have much contact with other postdocs?
8. How does this postdoc impact other areas of your life?
 - a. Family life?
 - i. How does work impact your family life and your role in your family?
 - ii. What does your career mean to your family?
 - b. Non-work life?
9. How was the process of adjusting to a new environment?
 - a. For you at a new job?
 - b. For you in a new country?
 - c. New job in a new country?
 - d. For your family?
10. What are your future plans after the postdoc?
 - a. How does the postdoc help you achieve them?
 - b. Where do you see yourself in ten years?

Postdoc families/partners:

1. Background information:
 - a. Partner's postdoc department and supervisor
 - b. What year of postdoc, whether it's first or second?
 - c. Country of origin
 - d. Family structure
2. How has your partner's postdoc affected the family?
 - a. Adjusting to a new country?
 - b. Pay cut/raise affecting standard of living?
 - c. Pride in achieving prestigious postdoc position?
 - d. Daily family life – division of domestic responsibilities
3. How has your partner's postdoc affected you as an individual?
 - a. How has it affected your previous career or educational track?
 - b. How has it affected your future career or educational plans?
4. How do you see your role as a partner of a postdoc?
 - a. How are you supporting your partner?
5. Does your partner's postdoc affect his/her other roles as a spouse or parent?
6. What changes do you expect and hope for once your spouse lands a permanent career?