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Worth doing but not worth having? The influence of personal aspirations and career expectations on the value of a doctorate

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Purpose

This study seeks to understand the interaction between the component domains of doctoral value to identify those which have a greater influence on overall perceptions of the value of a doctorate. It also investigates what may lead an individual to say it was not worth doing?

Design/methodology/approach

Using Bryan and Guccione's (2018) conceptual model of 'doctoral value', this study employed a qualitative survey, to examine 261 perceptions of the value of the doctorate in a range of employment contexts.

Findings

Individual, perceptions of value are dynamically influenced by the fulfilment of expectations, career achievements, and the employer's perception of the doctorate's value. We found that the circumstances of respondents' current employment are the most common predictor of overall perceived value, and that those who reported that their doctorates were 'not worth doing' attributed this to lack of a positive career outcome.

Originality

A recurring concept was that respondents considered that their doctorate had been 'worth doing' for the value it conveyed to them personally, but not 'worth having' due to its low value to employers. This new understanding illustrates the complexity of decision-making and the individual career timelines that influence value. Our research positions the 'career value' and 'personal value' domains as determinant in informing individual value judgements. Our findings lend weight to calls for doctoral education to focus on non-academic careers, and also inspire further investigation into how non-academic employers recruit, motivate, and value doctoral graduates.

Introduction

Doctoral graduate employment in non-academic careers has grown significantly enabling significant contributions to contemporary knowledge economies and industrial strategies (Auriol 2010; Neumann and Tan 2011). In some non-academic sectors - but not all (Kyvik and Olsen, 2012) - doctoral graduates are considered to be more highly skilled when compared to colleagues without doctorates, creating 'productivity spill-overs' and 'boosting university-business collaborations' (Diamond et al. 2014; e Colombo and de Castro Garcia 2020; Tzanakou 2012). The judgement of how valuable a doctorate is to, or within, an economy however is based on a sparse and intermittent evidence-base meaning that the value of doctoral programmes to society, the economy and the individual are poorly understood (Tzanakou 2021). The

same can be said about the level of industrial demand for doctoral graduates, beyond a few landmark studies (Diamond et al. 2014; Hancock et al. 2019).

The value of a doctorate within the context of (un)fulfilled career expectations

As throughput of doctoral graduates increases across the world, more studies are exploring the inter-relational and environmental factors that contribute to doctoral success and satisfaction (Agné and Mörkenstam 2018; Dericks et al. 2019; van Rooij et al. 2019). Sverdlik et al.'s (2018) systematic review also considers wellbeing, highlighting financial stress, and the tolls on social relationships and self-worth a doctorate can bring. These studies focus on the study period, and whilst they do not report on graduate employment, the factors reported are likely contributors to whether a doctorate is of value to the holder, within the context of (un)fulfilled career expectations. Yet, there is little reference in the academic literatures to how the personal investment of time, effort and opportunity cost (the loss of other alternatives when one alternative is chosen) are influenced by the doctoral and post-doctoral career environments.

The reality of post-doctoral career prospects is disjointed from the dominant ambitions of incoming doctoral researchers, that of an 'academic good life' (Burford 2018). The fact that doctoral study does not necessarily return higher salaries compared to HE degrees (particularly for women) is well known (Casey 2009). A recent large-scale study in the UK found that although both masters and doctoral level graduates earned more than those with undergraduate degrees only, doctoral graduates earned only 2% more than masters graduates by age 35 (Britton et al. 2020). Additionally, the number of academic positions has not kept pace with the doctoral graduation rate (Hayter and Parker 2019; Woolston 2019) and the role of chance in securing an academic career is increasing (Kindsiko and Baruch 2019). Non-academic careers are the more likely destination (Hancock 2021). Doctoral researchers may experience 'cruel optimism', an emotional attachment to attaining an academic career even though they know it to be unlikely and potentially problematic (Berlant 2011; Burford 2018). Unfulfilled expectations for the doctorate can lead to disappointment, stress and poor wellbeing (Guthrie et al. 2018; Paolo and Mañé 2016). Obtaining a particular form of employment has been conceptualised as a form of 'value added' within the student experience

(Kaye, Bickel, & Birtwistle, 2006), and unfulfilled academic career expectations leads to reduced satisfaction with the doctorate (Cheng, et al, 2016).

The persistence of academia-focused development programmes reinforces expectations of an academic career (De Grande et al. 2014; Sharmini and Spronken-Smith 2020) leaving graduates uncertain of the value of their doctorates outside the academy and unprepared to assimilate into new organisational cultures (Hancock 2019; McAlpine and Austin 2018, Skakni et al, 2021). Doctoral researchers need to be better equipped by their programmes to take up non-academic careers as doctoral programmes play a key role in setting career expectations including clarifying the value of the doctorate beyond the academy (Aarnikoivu et al. 2019). We predict that the (un)fulfilment or under-fulfilment of career expectations is an important influence on an individual's perception of the overall value of their doctorate. In this study therefore we focus on understanding perceptions of value within a career context, as an important determinant of overall perception that the doctorate was worth the time and effort invested in it.

Value framework

Access to diverse career paths, improved health and happiness, wider societal impacts and increasing the productivity of those around them are all recognised individual benefits of a doctorate (Mellors-Bourne et al. 2013). Heuritsch et al (2020) surveyed 1,133 doctoral graduates (from four Dutch universities) and found they gained skills, social status and preparation for their career goals. Their study of skills (mis)match relative to employability, reported that greater mismatches occurred for graduates outside academia than those within – similar to Wille et al.'s (2020) findings which reported employer's poor perceptions of the ability of doctorate holders to reorientate their skills into non-academic workplaces. In the USA, Conrey et al. (2020) explored graduate perceptions of value using a case study approach and used human capital theory to determine that the graduates had attained both personal and professional goals through their doctorates.

Bryan and Guccione's (2018) study established a conceptual model of doctoral value, from the individual perspective. Respondents derived value in four domains: personal,

skills, career, and social and community, all of which were influenced by: (1) the time since graduation; (2) the quality of their doctoral supervision relationships; (3) accrued social connectivity and esteem, and (4) employer perspectives on the value of the doctorate holder, and their professional capabilities. These findings, gleaned from 22 in-depth interviews resulted in the model below (Figure 1). Whilst Bryan and Guccione’s model offers a typology of value derived by individual doctorate holders, it does not offer insight into the relative importance of each of the domains of value, for an individual. Neither does it comment on the interaction between different domains of value, from a personal perspective. Whether certain types of value have greater importance for a doctoral candidate, and whether some types of value can compensate for others, is likely to have implications for how value is judged overall, and to influence value-seeking during the doctorate.

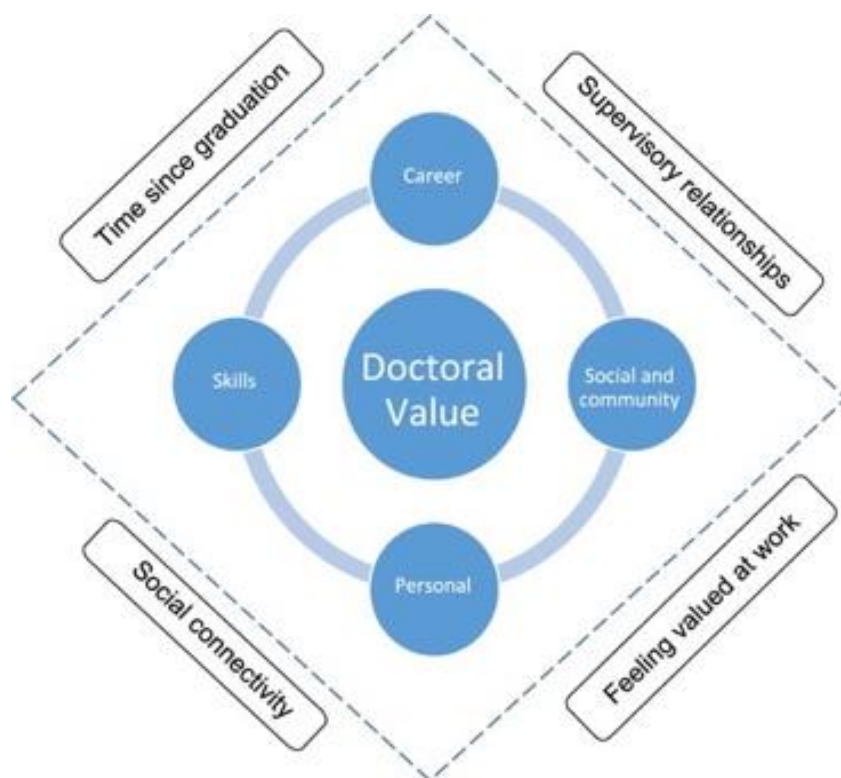


Figure 1. Conceptual model of doctoral value (Bryan and Guccione, 2018).

The study reported here seeks to further understand the dynamics of how graduates judge the value of their doctorates. Our specific objectives are:

- To test Bryan and Guccione's conceptual model of doctoral value in a larger pool with more diverse career contexts.
- To understand the interaction between the component domains of value and identify those which may have a greater influence on overall perceptions of value.
- To understand what factors, within a doctorate or after completion, lead an individual to say it was not worth doing?

Methods

We used a qualitative survey design to study the diversity of views on doctoral value within the doctorate holder population (Jansen 2011), rather than a statistical survey which only analyses the diversity of member characteristics within a population.

Participants and procedure

The survey ran between February 2017 and March 2018, using Google Forms. The target population was doctoral graduates in the broadest sense. A heterogeneous sample was sought to increase the generalisability of the findings, particularly across universities and countries. Convenience sampling was used as access to a comprehensive database of doctorate holders' characteristics with contact information was not available to the authors. The survey was distributed through existing alumni networks (using an institutional volunteer database) and cascaded to further institutions' alumni networks through the authors' own networks of over 40 Researcher Development professionals who were asked to share the invitation to participate. It was also posted as an open call on Twitter (due to the openness of the platform, and to increase the variety of job roles and locations of prospective respondents reached), and was re-Tweeted by university researchers, academic staff, and Researcher Development professionals globally.

The survey consisted of 12 questions which collected respondents' demographics (gender, nationality, ethnic background) details about their doctorate (discipline, country of degree award) and post-doctorate careers (years since graduation, number of jobs since graduation, current country of work, current work sector, current working pattern, current salary band). Following these demographic, study-mode, and career

details, four free text questions were deployed which interrelated the four domains of doctoral value described in Bryan and Guccione's model:

1. Between graduation and now how valuable has the doctoral experience been to you within your various job roles?
2. How valuable has your doctorate been in terms of social, personal, and professional networks?
3. Do you view yourself as changed, or different in the world because of your doctorate? And in relation to, and in comparison, to your family, friends, and society?
4. Overall, was the doctorate worth doing? Why / why not?

Ethical considerations

Ethical approval was granted from the University of Sheffield. An overview of the study, a participant information sheet, and a data protection statement were included in the survey header. Participants provided informed consent before accessing the survey.

Analysis

Response data was extracted, cleaned, coded and organised in Excel before being imported into NVivo (version 12) for detailed analysis. Response characteristics (all questions barring the four 'value' questions) were auto-coded and hidden from the authors during manual coding to guard against bias, thus using a mix of inductive and deductive coding (Jansen 2010).

An initial sample of 20 responses were coded independently by each author before collectively agreeing on the approach for further coding. Each author then manually coded the remaining responses prior to final discussion of the analysis. Further adjustments to codes were made before results were interpreted. The coding approach itself followed a thematic framework approach to systematically develop themes from the raw data. Codes and themes were continuously refined through peer debriefing between the authors and external colleagues. As this survey used a qualitative design it was deemed not appropriate for quantitative validation processes.

However, the way in which individuals had interpreted these questions was carefully considered as part of the authors' peer-debriefing process during all stages of the analysis. For each of the four free text questions, the authors sought individually to note any responses that could be deemed irrelevant, where the answer topic did not match the questions topic (indicating misinterpretation of the question), for discussion. No instances of irrelevant data were detected in the data set. Statistical testing was deemed inappropriate given the small and heterogeneous sample, and because our goal was to assess diversity in the population as opposed to correlation.

Results

Population

A total of 261 unique responses were collected and analysed. Respondent characteristics are described below to contextualise the analyses that follow, and key characteristics are set out in Table 1. Percentages indicate the proportion of respondents who provided an answer.

The majority of respondents were female (53%), STEM doctoral graduates (56%) who gained their degrees in the UK (86%). The most common ethnic background was white-British (49%) and the most common work sector was the academic higher education sector (42%). The majority were working in the UK (62%) on a full-time basis (77%). The median time-since-doctoral-graduation was five years, median number of jobs since graduation was two, and the most common broad salary band was £25,000-£50,000 (43%), with 14% of respondents earning between £30,000-£35,000. One-third of respondents had gained further qualifications post-graduation, mostly related to teaching in higher education.

Table 1. Demographic characteristics of survey respondents

Characteristic		Total (%)
Degree topic	STEM	145 (56)
	Arts, Humanities and Social Sciences	113 (44)

Gender (%)	Female	139 (53)
	Male	120 (46)
	Woman, Non-binary	1 (0.4)
	Prefer not to say	1 (0.4)
Ethnicity - grouped	White - British	127 (49)
	White - Other	75 (29)
	Asian	27 (10)
	Mixed	11 (4)
	Black	9 (3)
	Other	8 (3)
	Prefer not to say	4 (2)
Occupation-sector	Academic, Higher education	96 (42)
	Private	69 (31)
	Professional services, Higher education	25 (11)
	Public	21 (9)
	Third	13 (6)
	Prefer not to say	2 (1)

We chose to include the respondents not working in the UK in the analysis as we did not aim to attribute doctoral value judgements to country contexts, which also was not appropriate given the sample size. However, we did analyse value judgements against country of work to ensure we did not overlook any patterns in the responses. We found no clear differences in how respondents conceptualised value related to country of work, even when aggregated up to global region (e.g., North America, Europe). More in-depth explorations of country context on postdoctoral careers have been discussed elsewhere (e.g. Tzanakou, 2012) and were not in scope for this study. We also did not detect differences in the career demographics or value judgements of respondents from Humanities and Arts disciplines, when compared to Social Sciences disciplines. For this reason, we deemed it appropriate to aggregate them as one ‘HASS’ group. It should be noted that the grouped discipline indicators STEM/HASS are used throughout the data presented below to give illustrative context only.

Findings

Individual ungrouped codes generated from data in the four free text questions, were sorted into the four themes related to the four domains of value: ‘career’, ‘personal’,

'skills', 'social'. We then identified two further key concepts related to both the career and personal value domains, arising from across all four questions: 'expectations versus reality' (whether their doctorates had allowed them to achieve what they had set out to), and 'outweighing the negatives' (positive value gained in one value domain may outweigh significant negatives in the same or other domains), reported below. Our final key finding demonstrates that being valued at work, increases graduate perceptions of value overall.

In this report, respondent characteristics accompany quoted data in this format: country of graduation – doctoral subject area (grouped into STEM/HASS) – gender – employment status – sector of work (location) – years since graduation (ygs) – overall value judgement. 'Third sector' describes careers in the voluntary sector, non-governmental organisations, non-profit organisations, social enterprises, and cooperatives.

Each response to a value domain was coded 'high' or 'low' to provide a basic indication of the polarity of each response. In some cases, respondents indicated they had experienced both high and low value in the same domain. For example, holding a doctorate might convey low career value at one time, but high value later. We termed this 'mixed feelings', as one participant reported:

UK graduate – STEM – man – unemployed (Canada) – 11ygs – worth it: *For most roles my doctoral experience was of no value and did not help me get a better job in most cases. It was an asset only with getting my last job.*

We capture the incidence of 'mixed feelings' across the total sample in the two bottom rows of Table 2 below. For example, 242 respondents noted the value of the doctorate to their career, of which 52 gave examples of where the doctorate conveyed both high and low value experiences (21%).

Table 2. Incidence of both high and low (mixed) feelings across the value categories

Mentions	Career value (n=242)	Personal value (n=173)	Skills value (n=181)	Social value (n=160)	Was it worth it overall? (n=249)
1 (high or low)	190	140	145	128	244
2+ (high and low – ‘mixed feelings’)	52 (21%)	33 (19%)	36 (20%)	32 (20%)	5 (2%)

The charts which follow in key finding one, summarise the responses in relation to the four value domains established in Bryan and Guccione (2018) and ‘overall value’.

Key finding one: Value domains confirmed

The four value domains identified in Bryan and Guccione's, (2018) conceptual model of doctoral value (career, skills, social, personal) hold true in this larger dataset. The picture is very positive; the large majority of graduates in this study (83%) derived high overall value from their doctorates, particularly in their careers, skills and personal lives (Figure 2). Only 9% indicated that it had not been worth it, and 8% reported overall mixed feelings.

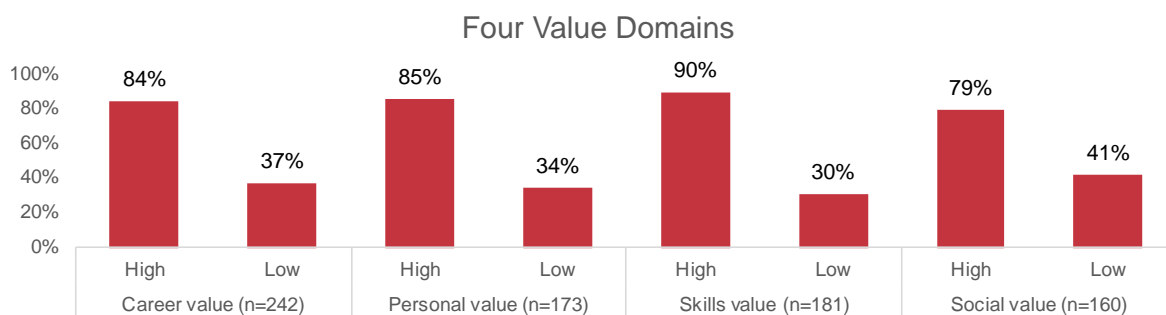


Figure 2. Summary of high and low value judgements across the four domains of Doctoral Value. For the reasons explained above, the percentages may total >100% due to the incidence of mixed feelings.

Most of these positive overall reports were decisive responses expressing no regrets or caveats, however some claimed the doctorate had been worth it overall despite also reporting significantly negative experiences in one or more domains. This is reported

further in key finding two below, which demonstrates that the overall value of the doctorate is judged on career and personal value judgements.

Key finding two: Overall value of the doctorate is determined by the career and personal domains

We identified two common sub-themes related to both the career and personal value domains: (1) expectation versus reality and (2) outweighing the negatives.

Expectation versus reality

Respondents' overall value judgements often hinged on whether their doctorates had allowed them to achieve what they had set out to, meeting a set of expectations, either during or post-doctorate. This is conceptualised well in the quote below:

UK – HASS – man – full-time – private sector (UK) – 2ysg – worth it:
I'd say yes, but only because my situation was that i was a member of staff who had a research grant to get my PhD. I personally wouldn't have valued it if I'd had to take a pay cut or not have my career progress at the rate it has. I understand why I made that decision at the time and then other circumstances meant that it's maybe not had the value I expected it to at the time, doesn't mean it was wrong.

Such expectations were most often related to career value, which was an important domain influencing whether respondents judged their doctorate to be worth it or not overall.

UK – HASS – man – full-time – third sector (UK) – 3ysg – not worth it: *No - I built up false expectations about my career prospects and have had to start from scratch. I spent years getting into debt for something I'm really passionate about, when I could have pursued it outside of academia and got on with building a normal life.*

Ireland – HASS – woman – full-time – private sector (UK) – 9ysg – mixed feelings: *I'm glad I completed it as it has changed the path of my life, but it has not provided the career and salary opportunities I was (at least half) expecting.*

Respondents also described comparing themselves to their peers who had not pursued doctorates, who they saw as equals and were expecting to have 'matched'. However, this was not always seen as an absolute disadvantage, as some expected the doctorate to put them back on a comparative level at a later date.

UK – STEM – woman – unemployed – 3ysg – not worth it: *[...] I knew from early on that I wouldn't remain in academia. I am four years behind where I might have been in my career (before I took a break to raise my family) had I not done the doctorate.*

UK – STEM – woman – full-time – private sector (UK) – 1ysg – worth it: *Yes, I believe it will put me ahead in the future, although I do feel behind compared to peers at the moment.*

Expectations related to personal value were equally powerful determinants of overall value but were often traded off against career value expectations or vice versa:

Ireland – HASS – woman – on sabbatical/maternity leave – university professional services (UK) – 5ysg - not worth it: *Not really. I had always wanted to do one from when I was little (and had no idea what it meant), so I stuck it out, but my career path has completely diverged from everything associated with it.*

Outweighing the negatives

Respondents reported that positive value gained in one value domain may outweigh significant negatives in the same or other domains. Strikingly the sense of pride and enjoyment respondents felt about their doctorates (personal value) was powerful enough to tip the balance for many in deciding whether their doctorate was worth it. This was the case even for graduates who had keenly felt negative experiences.

UK – STEM – woman – part-time – private sector (Canada) – 5ysg – worth it: *Yes! Although I have not been able to continue in my field (but would like to return eventually), it was a challenge I successfully completed. I loved the experience (the good and the bad) because for 3 years of life I got to do exactly what I loved doing! Life has a way of moving along and life priorities change. But overall, life is too short for regrets...*

UK – HASS – woman – full-time – public sector (UK) – 3ysg – worth it: *Yes, in terms of personal challenge, exploring the extent of my intellectual abilities and pride of achievement (and the creation of an original piece of research) but it nearly broke me. There were times that I felt I just couldn't go on*

Fulfilment of expectations for the doctorate that were deeply personally valuable generally outweighed unfulfilled career or salary expectations. This was the case even in the face of significantly negative career experiences.

UK – HASS – man – full-time – n/a (UK) – 4ysg – worth it: *In terms of personal development and growth it was worth it and my dream to do. I was very fortunate to have had the funding and also ability to do a PhD. On the other hand, it barely helps with most employment and the university and knowledge sector, which should be a home for PhDs is often hostile, tribal, political, and closed.*

Given the findings above, we checked the assumption that those indicating *high* value judgements in one or more domains, would judge their doctorates to have been 'worth it' overall, and we found it to be true; value in any one domain is enough to indicate overall value. Additionally, we found that majority of respondents judged their doctorate as being 'worth it' overall regardless of whether they described *high, low or mixed* value judgements in any of the value domains, meaning that even low value in one domain was enough for a respondent to consider their doctorate was worth it overall. We also found high overall value was reported for respondents indicating 'mostly low' or 'mostly mixed' value judgements across all domains. Meaning that

respondents who report gaining little from the experience in specific domains, still indicate positive perceptions of overall value. The above data strongly suggests that many respondents deemed their doctorates to have been worth it, regardless of how little value they might have derived from it, and even when they could not articulate that value.

UK – STEM – woman – full-time – university professional services (UK) – 6yysg – mixed: *it's hard to pinpoint obvious positives beyond getting a title that allows my navigation through an HEI to be that little bit easier. BUT, I still would do it again, for reasons that aren't all that obvious to me at the moment...*

Key finding three: Being valued at work increases value perception

The circumstances of respondents' current employment were the most common predictor of overall value revealing several common characterising factors: feeling valued by the employer, whether the doctorate could be attributed to the securing of the job, opportunity cost, and anticipated or future value. These were most often discussed in the context of their career journey 'on the whole' as opposed to the immediate fulfilment of career expectations described in the first theme.

Graduates who described feeling valued by their employer and colleagues, almost always indicated that their doctorate was worth it (89%). Being valued meant, for example, having professional credibility and attracting the respect of colleagues and employers. There was no clear relationship between perceived high value by employers, and reward in terms of salary.

UK – HASS – man – full-time – university professional services (UK) – 7yysg – worth it: *My current colleagues are impressed by my doctorate and there is a sense in the office that I am highly qualified*

Those who reported that their doctorates were not worth doing overall, or who were having mixed feelings, attributed this to their doctorate not resulting in a positive career outcome, for example, feeling under-valued by employers, feeling overqualified, being

in debt due to the doctorate, and having a reduced salary compared to others with longer employment experience.

UK – HASS – man – full-time – academic (UK) – 8ysg – mixed feelings: *But the fact remains that I feel overqualified for the role I am currently undertaking, and my employer certainly doesn't recognize financially the added value that I bring to my role.*

Around a quarter of respondents indicated that their doctorate was a job requirement and 88% of this group considered their doctorate to have been worth it. As expected, this was particularly evident for those employed in academia.

UK – HASS – woman – full-time – academic (UK) – 6ysg – worth it: *Yes. Because I now have a job that I enjoy for which a PhD is a necessary requirement.*

Many graduates considered the value of their doctorates in the context of what they might have done differently and what the doctorate might do for them in the future.

UK – STEM – man – full-time – private sector (UK) – 1ysg – worth it: *Mostly yes. In the short term, my career would have probably benefited more from having spent 4 years in work, rather than staying in education. However, in the long term, I expect the benefits of my PhD to take me further professionally than if I hadn't done one.*

It was acknowledged in the responses that the expectation-fulfilling job could often take time to secure and was a product of both the doctorate, and work experience.

UK – STEM – woman – full-time – private sector (UK) – 3ysg – worth it: *I was overqualified for my first job, which was aimed at a Masters graduate [...] I became frustrated that my PhD seemed pointless for that job, as I was underemployed and underpaid given my level of qualification. However, I could not have gotten my current (second) job without the PhD, and I am*

now very happily employed and paid at a level reflecting my qualifications, experience and ability.

Discussion

In this study, a high value doctoral experience across all domains of value is almost guaranteed to lead the graduate to feel their time and investment was 'worth it', but even a mixed or low value experience can still offer enough to enable graduates to report it was 'worth it despite the challenges'. It is important to note that positive overall value judgements can contradict collective low value judgements across domains and many of our observations stem from contradictions implicit in the text responses. This expands Burford's (2018) analysis of doctoral experiences as 'cruel optimism', into the post-doctoral period, and indicates that graduates may retrospectively maintain an attachment to the academic good life, minimising the impact of problematic experiences. Not all explicitly articulated how they rationalised this contradiction, suggesting to us that a proportion of respondents are reflecting a form of cognitive dissonance, believing both that their doctorates were not worth it in the specific domains, but also that the doctorate was worth it overall. They were able to articulate reasons for the former far more clearly than the latter.

The influence of another, as yet unidentified, value domain (that respondents chose not to articulate, or could not due to the limitations of our study design) could explain this finding. Alternatively, and given the lack of another domain of value arising from the data, we can speculate that when completing the final question of our survey some respondents intentionally failed to acknowledge the lack of value their doctorate has afforded them - evidence they themselves provided. This in survey behaviour reflects some aspects of the 'Ostrich Problem': where people intentionally fail to monitor their progress towards a goal (Webb, Chang and Benn, 2013). It may also relate to, in the wider context of completing the doctorate and continuing to pursue unlikely academic careers, some aspects of the 'Sunk Cost Fallacy', a greater tendency to continue an endeavor once an investment of money, effort, or time has been made (Arkes & Blumer, 1985). Both persisting in the completion of the doctorate, and the declaration of overall positive value, could be motivated by respondents' need to self-affirm, rather than admit that something as labour intensive as a doctorate was not worth the effort

that they put into it. We can then imagine that responses have been framed in a way that restores their self-worth and protects their view of themselves in response to recalling information that threatens that image – a defensive bias (Sherman and Cohen, 2002). This is seen in responses such as: “I still would do it again, for reasons that aren't all that obvious to me at the moment...” or “overall, life is too short for regrets”. A restoration of self-worth may feel possible by reflecting on only the positive aspects and not addressing the threatening information (Sherman and Cohen, 2006). Further in-depth qualitative work is required to pursue this line of inquiry and gain insight into the decision-making processes of this group.

A recurring concept was that respondents considered that their doctorate had been ‘worth doing’ for the value it conveyed to them personally, but not ‘worth having’ due to its low value to employers. Being in a role where the doctorate is valued and compensated appropriately by the employer increases a graduate’s perceptions of value within this determinant domain. Respondents who reported their doctorate wasn’t worth it, almost always attributed this to poor career prospects which aligns with the findings of Gaeta (2015) and Parenti *et al.* (2020) that non-academic employment is correlated with a higher probability of experiencing job-education mismatch, representing a sub-optimal return on the individual’s investment in their doctorate. We also detected instances in the data showing that unfulfilled expectations of a career where a doctorate would convey an advantage, can lead to disappointment, stress and poor mental wellbeing (Guthrie *et al.* 2018; Paolo and Mañé 2016). Our study emphasises the need for doctoral researchers to be better prepared by their programmes for a non-academic careers and new organisational cultures (Aarnikoivu *et al.* 2019; Hancock 2019; McAlpine and Austin 2018, Skakni *et al.*, 2021). This could be achieved by the employment in universities of Researcher Careers Advisers, who can help researchers to locate employment opportunities, and to translate their experiences, responsibilities and skills into the language required by a range of employers. Further, understanding how non-academic employers value doctorate holders is important, given that most graduates will be hired by those employers shortly after their doctoral studies, certainly in both the UK and Australian contexts (Guthrie and Bryant 2015; Hancock 2020), and attention should be paid to working in partnership with them. A recent review found that European non-academic employers *perceived* doctorate holders to be too specialised, lack commercial skills

and work experience, and to struggle to adapt to a non-academic environment (Wille et al. 2020). However, the same review found that employers who had *experience of actually hiring* doctorate holders had more positive perceptions of them, indicating that there are misconceptions and contradictions in non-academic sectors about the value of doctoral graduates. This study shows the impact of those misconceptions on doctoral graduates.

We found further evidence that overall value changes over time, particularly for career value, as respondents attributed their doctorates to their career successes. However, some respondents were only recently in a position they felt befitted their doctoral status, often citing previous unbecoming positions they had held. It is feasible that they may have judged their doctorates 'not worth it' had they answered the survey during that time. This reinforces recent recommendations from Conrey et al, (2020) that doctoral value and decision making should be explored longitudinally, and Hancock (2021) who also called for better longitudinal data following a UK-wide analysis of 4,731 doctoral graduates.

This study confirms that graduates perceive the value of their doctorate and the factors that influence their judgement in a way that is consistent with Bryan and Guccione's (2018) conceptual model. Furthering this model, our understanding of the dynamics of value is expanded through new insight into the complexity of decision-making about the overall value of the doctorate and the individual career timelines that influence value perceptions. We present an updated model (Figure 3) which emphasises the determinant role of career value and personal value in influencing overall doctoral value, and we consider these two domains to be more important in informing overall value judgements.

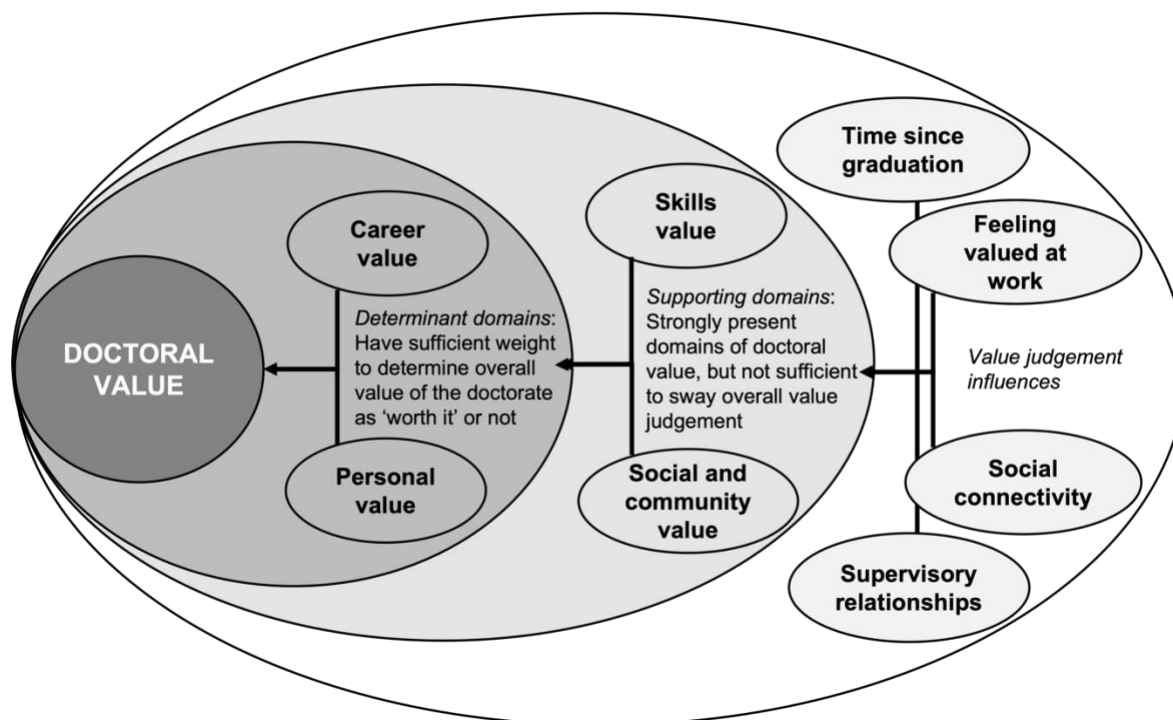


Figure 3. New conceptual model of doctoral value indicating determinant and secondary domains of value.

There are some limitations to this study. A purposive, representative sample could not be achieved, which would otherwise have enhanced the generalisability of these results and allowed comparisons of value based on gender, sexuality and ethnicity. However, the sample was suitable for a qualitative survey, and there was representation from graduates in a range of careers and career stages. The qualitative nature of inquiry, particularly in coding free text responses, can be prone to individual biases and a process of peer debriefing, review, and presentation of findings was employed to consciously reduce this. Finally, we regret not having asked respondents both about their (dis)ability status, how their doctorates were funded, and what type of doctorate they studied for (e.g. professional doctorate, by publication), as we realise now that these are also likely to impact upon value judgements.

Conclusion

The majority of our respondents derived great value from their doctorates across all four domains: career, personal, skills and social. The stories our respondents share here may strike a chord and support doctoral researchers to pursue and recognise the

value of their doctorate, making sense of their experiences, and preparing for the uncertainty and flux in the value they will perceive over time. We hope therefore that our findings will lend weight to the arguments of colleagues who support an approach to career building for a range of future employment scenarios as an integrated part of the doctoral experience, and as a way of adjusting expectations of an academic career. Evidence shows that doctoral researchers become less interested in academic careers when exposed through their programmes to the low likelihood of sustaining an academic career (Roach and Sauermann 2017).

Our new qualitative model of value can also act as a base for further quantitative questioning to better understand to what extent our results are representative across different demographic and disciplinary groups. Future research should aim to understand the how value perception may vary with motivations that influence choice of employer and their expectations about their ability to apply their doctoral skills and knowledge. We will seek to understand in greater detail, how doctoral value perceptions change over time, something we have only captured a snapshot of in this study.

We have demonstrated the tension between personal aspirations and career expectations on the perceived value of a doctorate. That a doctorate can be considered worth *doing*, where value is derived through the processes of personal development, but simultaneously not worth *having*, in the context of career satisfaction, is worthy of greater investigation. Our model may serve to initiate new conversations with those who recruit and manage doctoral graduates, about what they perceive to be the 'added value' of employing doctorate holders and help to dispel misconceptions and contradictions about their value. How to explicitly make a doctorate fit contemporary societal needs is a question that must be addressed by higher education managers and policymakers (Mewburn et al, 2020) and we suggest that this should be done in partnership, not with 'employers' but with the front-line managers of doctorate holders, in order to understand why some do perceive added value over and above a Master's Degree (Kyvik and Olsen, 2012) and why employers who had experience of actually hiring doctorate holders have more positive perceptions of them (Wille et al. 2020). Understanding how to recruit, engage and motivate doctoral graduates in the workplace, conveys advantages for employers as

well as employees and we suggest that the two sides of 'conveying value' and 'being valued' should be studied together as a piece. As noted by McAlpine (2021) further study should explore the interactions of this relationship to understand the supply and demand tensions inherent in determining the value of a doctorate.

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