

An academic career? What makes or breaks the psychological contract of PhD students throughout the doctoral program?

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1. Introduction

The Dutch government states in the *Wetenschapsvisie 2025* (Ministerie van Onderwijs, Cultuur en Wetenschap, 2014) that there is a need for more talent in the Netherlands in order to make the Dutch economy quickly adjustable. This need for more talent asks for a bigger flow of PhD graduates towards business and government, because PhD graduates have been trained in gathering new knowledge and they are able to critically weigh up and estimate the value of knowledge and insights. Koier and De Jonge (2018) wrote a report on the importance of the work of PhD candidates in the Netherlands and came to the following conclusions. First, the skills gathered in PhD trajectories are not only sought after within academia, because 70% of PhD candidates get a position outside academia. Second, getting a PhD degree is beneficial not only for the individual in terms of good career opportunities, good salary and satisfied with their jobs, but for the society as well, because of a well-educated population with skills that are in demand (Koier & De Jonge, 2018). Lastly, PhD graduates often perform research in their work outside academia and utilize the skills they have been taught at the university. Koier and De Jonge (2018) also state that it is important that the specific skills of PhD candidates are not only used in the academic world, but also in the labour market outside academia, because both the candidate and the society invested a lot in this degree. These conclusions show that the skills and work of PhD candidates are of importance on a societal level and not just in the academic world. The Ministry of Education, Culture and Science (2014) therefore pleads that the varying career patterns of PhD candidates show a need for a more differentiated design of doctoral programs that can also facilitate careers outside academia.

The population of PhD candidates can be divided into multiple groups in terms of their career aspirations. According to Koier and De Jonge (2018) 55% of PhD candidates in the Netherlands would like an academic career and this group thinks of a career outside academia as a second choice. Only 30% of PhD candidates, however, is actually able to obtain an academic position due to the amount of available job openings (Koier & De Jonge, 2018). This means that 25% of PhD candidates does not get to have the career they wanted. The other 45% does not even want to work in academia, which makes one wonder about the reasons of this group to finish a PhD program in the first place. Golde and Dore (2001) state that one characteristic of the PhD candidate population is that many PhD candidates do not understand what a doctoral study entails, how the process works, and how to navigate it effectively. Grasso et al. (2009) come to the conclusion that PhD candidates do not fully assess their readiness for a doctoral study and that the admission process of PhD candidates

fails to present sufficient information about the realities of the doctoral program and therefore may fail to recruit suitable PhD candidates. According to Grasso et al. (2009) this information should include completion rates, job placement of alumni, time-to-degree statistics and the required skills and knowledge expected of PhD candidates. If PhD candidates go into their programs with incomplete or false information, chances are that PhD candidates enter a reality that is different from their expectations. Nerad and Miller (as cited in Lehker and Furlong, 2006) find that perceived mismatches between PhD candidate expectations and the reality of PhD work, and what that means for PhD candidates' perceived career options, have been noted as contributing to PhD candidate withdrawal. Lovitts (as cited in Grasso et al., 2009) also finds that an incongruence between doctoral candidates' expectations of a doctoral program upon selecting and the realities of that doctoral program after entry is one of the reasons of high attrition rates among PhD candidates. Golde and Dore (2001) discovered that there is a mismatch between PhD candidate aspirations, the purpose of doctoral programs, and the careers they are actually able to obtain. However, the above described literature about the expectations and realities of PhD programs comes from a different context than the Dutch. An important difference is that PhD candidates in the Netherlands have a formal employment agreement with the university and a full scholarship (Levecque et al., 2017). This means that while PhD candidates are not only students, they are also employees. There are also external PhD candidates that combine their doctoral work with professional activities in other organizations (Van de Schoot et al., 2013). Van de Schoot et al. (2013) state that the high proportion of PhD candidates who are paid to work full-time or nearly full-time (0.8 FTE) on their research and PhD thesis is unique for the Dutch context. The different context makes it hard to say whether Dutch PhD candidates also experience this gap between expectations about the PhD program and what it is really like. It is also unclear whether Dutch PhD candidates also experience a mismatch between PhD candidate aspirations, the purpose of doctoral programs, and the careers they are actually able to obtain. This makes it necessary to look into the Dutch PhD candidates' expectations and experiences of their PhD program and their following career.

A theory that can lead to new insights about this problem, is the psychological contract theory. The psychological contract is defined as "an implicit understanding (as opposed to written or legal contracts) of give and take between two parties in a relationship. Psychological contracts are based on perceptions of a reciprocal arrangement individuals have with each other" (Bordia, Hobman, Restubog, & Bordia, 2010, pp. 2361). Robinson and Morrison (as cited in Bordia et al., 2010) state that the individuals in the relationship may not

be aware of the psychological contract of the other. Bordia et al. (2010) describe that breach of the psychological contract occurs when it is perceived that the other in the relationship did not keep his/her side of the bargain. In this context breach could be the mismatch between PhD candidate aspirations, the purpose of doctoral programs, and the careers they are actually able to obtain. Psychological contract theory can shed light on the consequences of breach, the expectations and promises that PhD candidates had in their minds about supervisors and the university and on the actual experience that PhD candidates had.

According to Robinson, Kraatz and, Rousseau (1994) the psychological contract evolves over time. Knapp and Masterson (2018) find that the differences between freshmen and more experienced undergraduate students in their psychological contracts point to the shifting importance of different aspects of psychological contract content across students' academic careers. In other countries where a PhD is an educational program and PhD candidates are considered students, it has been found that the road to a doctoral degree is not a straightforward process with the same challenges and situations throughout the entire doctoral program and that different stages can be distinguished (Ali & Kohun, 2007; Weidman et al., 2001). In conclusion, both the psychological contract and the circumstances can change over the course of a PhD trajectory. While there has not yet been research on this change in the Dutch PhD context, it would be important to do so. First, this would add to the existing literature on the shifting importance of different aspects of psychological contract content across PhD candidates' academic careers. Second, it would shed light on whether the Dutch PhD context also knows different stages or circumstances that contributes to a change in psychological contract. Universities could respond to this change in priorities in the psychological contract of PhD candidates to prevent contract breach and their negative consequences, such as withdrawal from the PhD trajectory. This is why more insight is needed in the psychological contract of PhD candidates throughout the doctoral program.

The aim of this study is to create more insight in the psychological contract of PhD candidates throughout the doctoral program and what expectations and realities of their PhD trajectory drove their decision to either stay or leave academia. Reality here means how the PhD candidates actually experienced their PhD trajectory in comparison to how they expected it to be. This leads to the research question:

How do PhD candidates experience the expectations and realities of their PhD program that lead to the decision to either stay or leave academia?

The research question will be answered with data collected through semi-structured interviews at two faculties at the Radboud University in Nijmegen. These interviews are done with PhD candidates who have (almost) finished their PhD program and they are asked to tell their experience of the PhD program and why they chose to stay or leave the academic world. The interviews are transcribed and analysed to find the answers to the research question.

Knowledge about the psychological contract of PhD candidates can help to understand what it is that PhD candidates expect and who they expect it from. When it is known what these expectations are, universities can then formulate a strategy to decrease the gap between expectations and reality in the minds of PhD candidates. This does not necessarily mean a university wide strategy, but different strategies aimed at faculties for example. Bordia et al. (2010) state:

Educational institutions often operate in a highly competitive environment in terms of student recruitment. Under such circumstances, generating promises that seem better than those of the competitors may lead to the short-term gain of attracting students, but the longer term issues of unfulfilled promises, lack of satisfaction, lowered psychological well-being, and falling retention rates (p. 2379).

In other words, breach of the psychological contract and its' negative consequences can be decreased when there is knowledge about the perceived promises and expectations of PhD candidates about their PhD programs and following careers.

Previous studies give insight into the exchange partners with whom students have a psychological contract, what these contracts are based on and what the consequences of breach of the psychological contract can be. However, these studies took place in contexts where PhD candidates are considered students, whereas this study gives insight in the psychological contract of PhD candidates in a context where they are considered employees. This study looks into the psychological contract of PhD candidates and whether breach or fulfilment of that contract plays a role in the choice for an academic or a non-academic career. This contributes to psychological contract theory, because this is a qualitative study that looks back on the PhD trajectory and therefore shows the changes that the psychological contract has gone through and how these changes play a role in career choices.

This thesis has the following setup. First, the theoretical background is described. Then, the methods are explained. Next, an overview of the results and the analysis is given. Finally, in the conclusion and discussion the analysis is linked to the theoretical background and recommendations for practice and future research are given.

2. Theoretical background

In this chapter the theoretical background of relevant concepts is discussed. First, a literature overview of the topic of the psychological contract of PhD candidates is given. Thereafter, it will be explained what is known about the Dutch PhD experience and what this research still needs to focus on in order to give more insight in the decision to stay or leave academia. Then, it is explained what is known about the experience of a PhD program in terms of the relationship with the supervisor, mental health, stages of the PhD trajectory and career development. Lastly, the model by Bordia et al. (2015) is used as a guideline to explain how the psychological contract develops.

2.1 Literature overview

Previous studies that looked into the psychological contracts of students have either focussed on undergraduate students instead of PhD candidates, the psychological contract of PhD candidates in general instead of a specific focus of the contract or investigated an exchange relationship with a specific party. Wade-Benzoni et al. (2006) and Koskina (2013) focus their research on the psychological contracts of PhD candidates. Wade-Benzoni et al. (2006) choose to focus on the quality of collaborations between PhD candidates and faculty, while Koskina (2013) is more exploratory and lets the PhD candidate tell her who they perceive to have a psychological contract with. This gives Koskina (2013) the space to come to the conclusion that PhD candidates are part of a three-party exchange relationship consisting of the PhD candidate, the supervisor and the university, instead of the usual two parties and that it differs per party whether the contract is based on promises or expectations. Bordia et al. (2010) also focus on collaboration between students and their thesis advisor, but this study differs from Wade-Benzoni et al. (2006) in that these are undergraduate students who work in group thesis projects. Where Wade-Benzoni et al. (2006) find that the type of contract, research type and high/low consensus in disciplinary paradigms influences the quality of the collaboration, Bordia et al. (2010) find that psychological contract breach in the advisor-student relationship leads to lower levels of psychological well-being and project satisfaction. Both Koskina (2013) and Knapp and Masterson (2018) do not a priori focus on a specific exchange relationship between students and a certain party, but let the student tell them who they perceive to have psychological contracts with. The difference is that Knapp and Masterson (2018) focus on undergraduate students and Koskina (2013) focusses on PhD candidates. Where Koskina (2013) finds that PhD candidates perceive to have a three-party

exchange relationship, Knapp & Masterson (2018) find that undergraduate students perceive to have multiple contracts with multiple parties. Both studies find that the content of the psychological contract can differ per exchange partner. What will be different in this study is the Dutch context in which PhD candidates are considered employees and the focus on the decision to stay in academia or not.

2.2 PhD in the Netherlands

Dutch context

The Dutch system of doctoral education has multiple characteristics specific to the Dutch context (Van de Schoot et al., 2013). First, most PhD candidates are employed by the university for a set period of time to complete a PhD. The funding for these positions within the university often stems directly or indirectly from an external source, such as a research grant (Van de Schoot et al., 2013). Second, most PhD candidates are paid by way of the university as regular employees with a set salary level (set by collective agreement) (Van de Schoot et al., 2013). This means that there is a high proportion of PhD candidates who are paid to work full-time or nearly full-time (0.8 FTE) on their research and PhD thesis. The advantage here is that because PhD candidates have a steady pay check, they are often successful in completing the doctoral trajectory within the pre-set time period (Van de Schoot et al., 2013). However, problems occur when there is a delay in finishing the thesis, because external funding generally do not provide for the coverage of salary costs associated with an extension of a PhD contract. This means that either the university pays the salary of the PhD candidate or the PhD candidate has to finish the thesis in their own time (Van de Schoot et al., 2013). When the thesis has to be finished in the candidates' own time, the risk increases that the thesis will not be completed. This can mean a significant financial loss, because universities are rewarded financially by the government for PhD completions (€90,000 per successfully defended thesis) (Van de Schoot et al., 2013).

Mental health and an academic career

The PhD trajectory seems to be a heavy challenge in itself when one looks at the mental health of PhD candidates. Van Rooij et al. (2019) find that 42% of the PhD candidates in Groningen are considered to be at risk of developing a psychiatric disorder. While measured on the same scale, the results are even higher than the 32% of PhD candidates found in a study in Flanders (Levecque et al., 2017) and the 38% found in Leiden (Meijer et al., 2018). Levecque et al. (2017) find that the most common problems are feelings of being under

constant strain, unhappiness and depression, sleeping problems due to worries, inability to overcome difficulties and not being able to enjoy day-to-day activities. According to Meijer et al. (2018) predictors for mental health problems are not being able to deal with the workload, a low feeling of competence, dissatisfaction with the supervisor and a lack of social support by colleagues, the supervisor or both.

Van Rooij et al. (2019) find a difference between junior (first two years of the program) and senior PhD candidates (final years of the project). Of the senior PhD candidates, 48% are at risk of developing a psychiatric disorder, but “only” 36% of the junior PhD candidates are at this risk. The juniors rated their current mental health substantially higher than the seniors, and reported less often having experienced, or to be currently experiencing, mental health problems. Junior PhD candidates indicated a lower workload and lower complexity of their PhD project and were more confident that they would be able to finish their PhD on time. Mental health problems also affected the choice between an academic career and a non-academic career. Van Rooij et al. (2019) found that almost half of the respondents expected that their mental health would improve if they pursued a career outside academia after having finished their PhD and that most of these PhD candidates also aspired to pursue a career outside academia because of this. Senior PhD candidates were also more pessimistic than juniors about their mental health if they would choose an academic career after finishing their PhD. Van Rooij et al. (2019) found that PhD candidates often worry about their career. The ones that want an academic career worried most about the high competition, a work-life balance and having to move to another city or country. PhD candidates that want to work outside academia mainly worried about not knowing what kind of career they want, about feeling unprepared for the job they want, and about having to start a new job before finishing their PhD thesis.

Apparently, somewhere in the process of the PhD trajectory something changes in how PhD candidates experience the PhD trajectory. Therefore it is important to look at how the PhD trajectory elapses.

Supervisor

Woolderink et al. (2015) studied the relational aspects of PhD supervision in the Netherlands. They state that one of the most pronounced reasons for dropout is a personal mismatch between supervisors and PhD candidates (Graduate school CAPHRI, as cited in Woolderink et al., 2015). It is important to note that the relationship between a PhD candidate and a supervisor is based on a power difference. From the viewpoint of the PhD candidate, the

dependence on the supervisors' judgement, feedback, availability, and approval affects the trust in one-self and self-esteem and can cause insecurities that may vary from minor uncertainties that can easily be solved or discussed, to fundamental insecurities that can hamper daily functioning. Although supervisors may also be well-aware of this disparity in their mutual relation, they may not always be aware of the day-to-day effect it has on the state of mind and attitude of their PhD candidates and the level of insecurity and dependence it involves (Woolderink et al., 2015). To explain what PhD candidates might need and expect from their supervisor, Woolderink et al. (2015) found three themes that were relevant for supervision: personality, knowledge and skills, and communication and coaching. First, *personality* wise PhD candidates were affected in their motivation when their supervisor was involved, empathic, open, a good listener, and responsive. Motivational problems occurred when there was a lack in personal attention (Woolderink et al., 2015). Second, when it comes to *knowledge and skills*, PhD candidates expected expertise on the content, methodological skills, abundant experience in publishing, knowledge of statistical methods, and having an extensive network. PhD candidates found it also very important that they were provided with good content-related feedback, which should be specific and provide a clear direction to the work in progress. Lastly, the valued *communication and coaching* skills were receiving constructive feedback, supervisors taking the lead when necessary, and providing clear direction.

Now that some important factors of a PhD trajectory in the Netherlands have been discussed, the next part of this chapter will look into relevant factors of the PhD experience in countries where PhD candidates are considered students. These factors are important for the PhD experience, but so far there has been little research done on these topics in the Dutch context where PhD candidates are considered employees.

2.3 PhD trajectory as a student

The meta-analysis done by Sverdlik et al. (2018) on the experience of a PhD trajectory names the role of the supervisor the most influential external factor that affects PhD students' experience of graduate school. This factor influences satisfaction with the program, attrition, PhD candidates' emotions and academic persistence. Sverdlik et al. (2018) find that a lack of social support and/or work-life conflict lead to a lower well-being and a higher prevalence of mental illness among PhD candidates. Well-being is also affected by financial opportunities and the social structures of their department.

Career development

The road to a doctoral degree is not a straightforward process with the same challenges and situations throughout the entire doctoral program. According to Golde (1998), PhD candidates go through a double socialization, with students being socialized not only into their roles as PhD students but also as members of their professional community.

The study by Ali et al. (2007) focusses on what is needed in the role as student. Doctorate studies are very different from any other study that the student has completed, which can be explained from two perspectives (Ali et al., 2007). From the academic perspective doctorate studies are different in the focus on research while previous studies have focussed more on the practical side of the field. It prepares students with a different scope and purpose. From the social and psychological perspective, students are subjected to new ways of socialization and psychological demands that are specific for the doctoral program itself. Students have to deal with new identities, fellow students, faculty members and the institution (Ali et al., 2007). Ali et al. (2007) describe that to complete a doctoral degree PhD students go through with four distinct stages: Preadmission to Enrollment, First year of the program, Second year through candidacy and Dissertation. These stages are characterized by different tasks and challenges that affects the students differently.

A study that focusses on the different stages that PhD students go through professionally has been done by Weidman et al. (2001). They base these stages on research on adult socialization, role acquisition, and career development. They say that professional identities are formed in four stages: the anticipatory stage, the formal stage, the informal stage and the personal stage. First, in the *Anticipatory Stage*, students become aware of the behavioural, attitudinal, and cognitive expectations of the new role they need to take on. This stage is the preparatory and recruitment phase when students enter the doctoral program with stereotypes and preconceived expectations (Weidman et al., 2001). Second, in the *Formal Stage* they receive formal instruction and get to know their field. Communication becomes informative through learning course material, regulative through embracing normative expectations and integrative through faculty and student interaction (Weidman et al., 2001). Third, in the *Informal Stage* students learn additional informal role expectations by interacting with departmental faculty and peers. Students learn that there is some flexibility in carrying out the role while still meeting the requirements. Here the student starts to feel more like a professional than a student (Weidman et al., 2001). Last, in the *Personal Stage* the students internalize the role and form their professional identity. "At this point, students assess their

career marketability, degree of competitiveness and aggressiveness needed to succeed in the professional world, scholarly concerns such as advancing in the field, and commitment to both personal and professional development beyond graduation” (Weidman et al., 2001, p.28).

The above described studies show that the focus and challenges of PhD students shift during the doctoral program, with a bigger focus on profession and career towards the end of the program. Similar observations were made by Knapp & Masterson (2018) in a study on the psychological contract of undergraduate students in which they find differences between freshmen and more experienced undergraduate students in their psychological contracts. They say that these differences point to the shifting importance of different aspects of psychological contract content across students’ academic careers. Studies that have focused on the career development of PhD students also find differences in their results as PhD students progressed through their programs. Helm et al. (2012) find that PhD students’ career goals developed throughout their doctoral career. Kim et al. (2018) found that the goal to work as a faculty member diminishes as PhD students progress through their program and Heflinger & Doykos (2016) find that PhD students’ perception of preparation for a career was negatively related to year in program. Heflinger & Doykos (2016) suggest that the reason is that the closer PhD students come to the job market and the more experience they have in the program, PhD students may be more aware of the skills required for continuing development and, thus, more alert to gaps in the institutional resources available to them.

Studies on the career development of PhD students seem to show some contradicting results when it comes to what PhD students need and want. Helm et al. (2012) find that career services and guidance for academic & non-academic careers are the most pressing needs among PhD candidates when it comes to career preparation & job search guidance. PhD students think that the major responsibility for the employability development process belongs to the PhD students themselves. The university should present information to students, but whether PhD candidates take advantage of that information is their own responsibility (Golovushkina & Milligan, 2013). The role of the advisor seems important (Heflinger & Doykos, 2016; Kim et al., 2018), but it is debatable to what extent career development is his/her responsibility (Golovushkina & Milligan, 2013). Helm et al. (2012) find that the career goals of PhD students require diverse training for both academic and non-academic careers, but many PhD students believed that they had deficient systems of support for these plans. Other studies find that there seem to be opportunities for career development available, but it differs whether these opportunities are what the PhD student needs and wants (Golovushkina

& Milligan, 2013; Heflinger & Doykos, 2016; Morrison et al., 2011), whether they know of its existence (Golovushkina & Milligan, 2013) and whether they will take advantage of these opportunities (Harvey, 2001). However, these studies have been performed in different environments and disciplines, so this actually shows that PhD candidates in different environments have different needs. Therefore they will have different psychological contracts, of which the details will be explained next.

2.4 Phases of the psychological contract: formation, evaluation, breach

Bordia et al. (2015) proposed a model consisting of three phases: (1) the formation and content of the psychological contract, (2) the evaluation and state of the psychological contract and (3) outcomes of psychological contract breach/fulfilment. This model is based on international business students, but will be adjusted and applied to PhD candidates.

Phase 1 is concerned with the sources PhD candidates use to come to the content of their psychological contract and what the content of their psychological contract is. Bordia et al. (2015) make a difference between sources in the pre-recruitment process and the sources in the recruitment process. candidates gather information in both processes that leads to expectations in their psychological contract. In the *pre-recruitment process* information may be gathered from the educational provider such as brochures and application packages that schools send when requested by prospective candidates (Mazzarol, 1998). Information can also be gathered from institutional websites, advertisement, communication with representatives of the institution. These formal sources may be checked by the candidate with social sources like friends and family to see if the university and study/degree of their choice is worth enrolling in (Bordia et al., 2015).

In the *recruitment process* the candidate will use the gathered information to decide which university and program of study they will apply for. In this process the students need more specialized information, which can be done by face-to-face or technology-driven interviews, scanning of school websites, online communication with faculty and administrative members of the institution (Mazzarol, 1998). In this stage the universities often ask prospective candidates to share their personal and professional information to judge the capabilities of the candidate (Bordia et al., 2015). PhD candidates in the Netherlands can be considered job seekers and as such, this is the time that they actively seek verbal and written promises about availability of resources and services that they find essential to achieve their educational, professional and personal goals (Suazo et al., 2009).

The psychological contract in this phase can be called the anticipatory psychological contract. De Vos et al. (2009) state that “The Anticipatory Psychological Contract is formed during the anticipatory socialization stage, i.e., the period which precedes organizational entry during which future employees develop expectations about what their new role will be. The APC is an imperfect schema about the future employment deal that enumerates the promises employees want to make to their future employer and the inducements they expect in return.” (p. 290) They explain that it is likely that the obligations that are salient in their preemployment beliefs are likely to affect their psychological contract beliefs and evaluations, once they have entered the organization.

The *content* of the psychological contract consists of both implicit and explicit elements (Koskina, 2013). Koskina (2013) found in her study that the exchange relationship of PhD students is not between two parties, but between the student, the supervisor and the university. Students see themselves as the focal person in this three party relationship. A difference was found between the basis upon which the contract was formed. The relationship between the student and the supervisor was based on expectations and the relationship between the student and the university was based on promises (Koskina, 2013). At the university level the students referred to promissory expectations, which were seen as obligations. When it comes to non-promissory expectations, four implicit expectations were identified: social networking, new experiences, development of soft/employability skills (e.g. negotiation, presentation, team working) and “membership of a positive (‘safe’, ‘relaxing’, ‘comfortable’, ‘informal’, ‘supportive’ and ‘enjoyable’) learning community that provided opportunities to ‘think out of the box’, be ‘creative’ and ‘afford to make mistakes without being laughed at’” (Koskina, 2013, p.1030). Especially social networking and development of soft/employability skills seem to be relevant for the careers of PhD students. Since the nature of educational programs in most universities is professional, mentoring and career support may be an important long-term obligation (Dedrick & Watson, 2002). Levecque et al. (2017) find that career prospects, both in and outside academia, were a determinant of mental health problems and that universities could therefore benefit from offering PhD students clear and full information on job expectations & career prospects.

In **phase 2** the perceived performance of the university determines whether candidates perceive fulfilment or breach of the psychological contract (Bordia et al., 2015). Zhao, Wayne, Glibkowski, and Bravo (2007) differentiate between breach and (un)met expectations, because they find that breach is a stronger predictor of outcomes. They state that future research should focus on the perceptions of the organization's promises and fulfillment of

such promises. Here it is important to make a distinction between breach and violation of the psychological contract. Morrison and Robinson (1997) stated that the concept of violation is an emotional response to breach of the psychological contract.

PhD candidates will also gather information from contacts that they have in different faculties and universities, which will help them to make sure whether their psychological contracts have been fulfilled or breached. Perceptions of breach could be a result of comparing services provided by different institutions (Bordia et al., 2015). The perceived institutional obligations will be evaluated by candidates after the study has begun (Sam, 2001). The evaluation will in turn lead to breach or fulfilment of elements of the psychological contract (Morrison & Robinson, 1997). Important here is that candidates can perceive fulfilment of some elements and when it comes to other elements of the psychological contract, they perceive breach. Breach can also be perceived when fulfilment of certain elements are delayed (Bordia et al., 2015). Robinson et al. (1994) state that the psychological contract evolves over time, meaning that the content and perception of breach and fulfilment can be different at different points in time.

Phase 3 deals with the outcomes of fulfilment and breach. Breach of the psychological contract has all kinds of consequences for PhD candidates. Zhao et al. (2007) find that breach leads to negative psychological and emotional reactions with employees, such as feelings of violation and mistrust. These reactions then have a negative effect on work attitudes (job satisfaction, organizational commitment and turnover intentions) and work behaviour (organizational citizenship behaviour & in-role behaviours). Bordia et al. (2015) make a similar distinction in reactions to breach or fulfilment; affective outcomes (emotional reactions) and attitudinal and behavioural outcomes. The experience of breach/fulfilment and its resulting emotional state may lead to attitudinal and behavioural outcomes (Bordia et al., 2015).

Fulfilment will lead to positive *affective outcomes* for PhD candidates, which means that they will feel a variety of positive emotions when elements of their psychological contracts are met (Bordia et al., 2015) When candidates receive more than the perceived obligations of the candidate, this might lead to more positive emotions such as happiness, delight and a sense of optimism about their educational and professional future (Rousseau, 1995). On the contrary, negative emotional reactions are likely when candidates perceive breach of the psychological contract (Morrison & Robinson, 1997). They may feel a sense of violation or mistrust when the university does not keep up their end of the bargain (Zhao et al., 2007). The intensity of the emotional reaction depends on how let down the candidate

feels. At the very least, they will be disappointed and frustrated when they encounter breach. When the breach is perceived as severe it could lead to more complex negative feelings such as depression, sense of betrayal or loss of trust in the university (Rousseau, 1995). The emotional reaction of the candidate depends on the overall evaluation of breach/fulfilment of the contract. Candidates prioritize certain elements of the psychological contract (Ramburuth & Tani, as cited in Bordia et al. 2015). For example, candidates may have placed a higher priority on academic quality than on recreational facilities on campus (Bordia et al., 2015). This means that not only breach/fulfilment of the element of the contract determines the extent of the emotional reaction, but that the importance of the element plays a big role as well. So, when a certain element of the psychological contract is deemed more important, there is a bigger emotional reaction when this element is violated than when this element is deemed less important.

When it comes to *attitudinal & behavioural outcomes*, fulfilment could lead to high attendance and participation, higher motivation to learn, high performance, a positive attitude towards the university, and positive word of mouth recommendations to prospective candidates (Bordia et al., 2015). Breach, on the other hand, could lead to absenteeism, lower performance, decision to leave before degree completion, (in)formal complaints to the university, negative word of mouth recommendations to prospective candidates and lack of interest in social networking (Zhao et al., 2007). Robinson et al. (1994) find that breach affected employee obligations more than employer obligations. The failure of an employer to fulfil its commitments to the employee was found to be significantly associated with decrease in employee obligations. Employees who have experienced breach may find adjusting their own obligations to be the most feasible reaction. Employees may feel that they cannot change their employers' behaviour and therefore just adjust their own perceived obligations in order to create a new balance.

Klein et al., (2016) describe that commitment to the organization can recover after psychological contract breach. After a period of two to ten weeks after psychological contract breach there are four possible outcomes distinguished in the post-violation model (Klein et al., 2016). When a psychological contract is *thriving* the relationship with the employer has improved after a breach and has become more beneficial to the parties involved. The psychological contract can be *reactivated*, which means that the content of the post-breach contract is equivalent to the pre-breach contract. When the psychological contract is *impaired*, the employee is forced to accept a less-than-ideal employment situation and will be willing to invest less effort than before to support the organization. Finally, when a psychological

contract is *dissolved*, employees are no longer committed to the organization and may withdraw from contributing to the organization. Determinants of breach resolution success depend on the perceived severity of the breach and the perceived organizational support.

In conclusion, much of the relevant literature comes from a different context than the Dutch, which is why the psychological contract of PhD candidates in a context where they are considered employees has been understudied. Apart from their mental health, worries about their career and the relationship with their supervisor, there is little in depth understanding as to how PhD candidates experience their trajectory and why they choose to stay or leave the academic world. The questions that emerge from the above described literature are how do PhD candidates experience their PhD trajectory in a context where they are considered employees? To what extent were there discrepancies between their expectations and their actual experiences (psychological contract breach)? What factors make PhD candidates leave or stay in the academic world after their PhD trajectory? To what extent is the career choice of PhD candidates determined by their psychological contract? In the next chapter it will be discussed what methods will be used in this study to give insight in these knowledge gaps.

3. Methodology

3.1 Research strategy

The aim of this study is to create more insight in the psychological contract of PhD candidates throughout the doctoral program and what expectations and realities of their PhD trajectory drove their decision to either stay or leave academia. A qualitative approach will be used to answer the research question, because qualitative research regards all forms of research that are aimed at gathering and interpreting linguistic material to base statements on about a social phenomenon in reality (Bleijenbergh, 2013). This study is interested in how PhD candidates experienced their PhD trajectory and their psychological contract and how this determines their choice to stay or leave academia. The focus of this study, therefore, is on how the PhD candidate describes in their own words their experience of reality. A case study of the Radboud University Nijmegen will be done to study this phenomenon. According to Yin (as cited in Buchanan, 2012) “a case study is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (p.353). Because the psychological contract of PhD candidates is a phenomenon that is investigated in depth and within its real life context in this study, the case study is chosen as the method of research here. The choice was made to study two faculties, so that these could be compared. However, this research was conducted in the middle of the corona pandemic and due to very limited response from the two faculties, the scope had to be broadened and all faculties were contacted in order to get more respondents. Radboud University Nijmegen was chosen because this is a broad university with multiple faculties and disciplines, which was necessary to be able to compare faculties. A practical reason is that this university is close by for the researcher.

Semi-structured interviews were the method of data collection. The data gained in the interviews was analysed with a thematic narrative analysis. In the following sections the methodology will be explained in more detail.

3.2 Respondents

To create more insight in the psychological contract of PhD candidates throughout the doctoral program and what expectations and realities of their PhD trajectory drove their decision to either stay or leave academia, the PhD candidates themselves need to be asked about this since this cannot be observed. Knapp & Masterson (2018) state that a psychological

contract exists in the mind of an individual and reflects his/her *perception* of a deal. Hence, the best source of information regarding the nature of psychological contracts is the candidates themselves. Because the focus is on what, why and when something changed in the psychological contract of PhD candidates over the course of their PhD trajectory, the respondents of this study needed to be finished or nearly finished with their PhD. Therefore, the respondents had to be alumni and PhD candidates who are in the last stage of the PhD trajectory. Here too, the scope of the target group had to be broadened because of limited response. PhD candidates that were not near or at the end of their PhD trajectory were also accepted as respondents.

In total, eleven PhD candidates were interviewed. Three PhD candidates followed their PhD trajectory at the faculty of medical sciences, one at the faculty of science and seven at the faculty of management. Three of the respondents were external PhD candidates and eight of them internal PhD candidates. Two of the respondents were not near the end of their PhD trajectory, but in their first and second year of their program. One of them had previous experience as a PhD candidate when he followed an external PhD program.

3.3 Data collection

The respondents were contacted via e-mail, newsletters, social media and internal communication channels. First, the faculties of social science, science and medical sciences were asked to send a request (Appendix B) to their alumni's and PhD candidates who are near the end of their doctoral program with information about this research and the question whether they would like to help me by doing an interview with me. Because of limited response after a month, all other faculties at the universities were also approached to send out this request. This request also included my e-mail address and phone number so the respondents could reach out to me. I chose to let the faculties send the request to their alumni's and PhD candidates, because then I would not see the private email addresses of these people unless they chose to reach out to me. I have also addressed the PhD Organisation Nijmegen (PON) with the same request. The snowballing technique was also used to get in touch with more respondents.

The data was collected through semi-structured interviews. Research interviews are deemed reliable gateways into what goes on in organizations, like the values and beliefs of people and how decisions are made (Alvesson & Ashcraft, 2012). Interviews produce rich materials about the way respondents experience a situation and about the context of the problem (Bleijenbergh, 2013). Bleijenbergh (2013) states that by asking respondents open

questions they answer these questions in their own words. The way the respondents formulate their own experiences gives insight in not only how they perceive their world, but also the shared values within their organization. For the interviews a topic list (Appendix A) was used to create some structure in the interview. According to Alvesson and Ashcraft (2012) an intensified structure tends to amplify the probability that interviewees will respond to parameters set by the researcher rather than pursuing themes that they regard as interesting or important, but it also facilitates an easier sorting comparison and analysis of the material. The interviews however, are semi-structured, so that there is room for relevant material that the respondent wants to talk about (Alvesson and Ashcraft, 2012). An advantage of structuring the questions beforehand is that the researcher has a say in which information is discussed during the interview, without restricting the respondents to a certain wording of the answer. It also means that all respondents get the same questions, which makes the data collection more reliable (Bleijenbergh, 2013).

The topics included the experience of the PhD trajectory, the psychological contract, and the choice for an academic or a non-academic career. The interviews had a duration of between the 40 minutes and 1,5 hours. The interviews were held in Dutch and English. The research is conducted in the time of the corona virus. This means that most, if not all, of the interviews have to held online. The interviews were all conducted via Zoom, because of the corona lockdown in which it was not allowed to meet with people in person. According to Hanna (2012) there are some benefits when it comes to the use of skype (or other technologies used for video calls). The researcher can easily record the interview with software on the device that they are using. There are low costs to conducting the interview, because nobody has to travel. Respondents that live further away can now be reached without the extra travel time and costs. She also said that the usage of skype allowed the respondents to remain in a safe environment like their homes without the interviewer entering their personal space (Hanna, 2012). Lo Lacono et al. (2016) argue that while some of the rapport may be lost in video calls in comparison to face-to-face interviews, in some cases respondents are actually more comfortable to open up in a video call. This depends on the topic of research and the personality of the respondent and the researcher. After the interviews were conducted, member checking was achieved by sending the transcript to the respondent of that interview to verify whether anything that was written down was misinterpreted or misrepresented, so that the respondent could make an adjustment. Two respondents made an adjustment.

3.4 Research ethics

According to Holt (2012) the respondents need to be informed about the purpose of the research being proposed and about the amount of time that the interview would approximately take. They will be told that they could withdraw at any time. The respondents will also be told that any information that they would give me is anonymous and that this information will only be used for the purpose of this research. It will be asked of the respondents if they are okay with the recording of this interview and they will be told that they could ask me to stop the recording at any time. After the transcription of the interviews the recordings of the interviews will be deleted.

3.5 Data analysis

The interviews will be transcribed and then analysed. In this study the aim is to find out how PhD candidates experienced their career development throughout the PhD trajectory through the lens of psychological contract theory. A way to analyse these experiences is through the narratives told by the respondents in the interviews. Narratives are often regarded as the central means through which people construct, describe and understand their experiences (McAdams, as cited in Maitlis (2012)). Essers (2009) argues that life-stories cannot be solely made by the teller; the interviewer is an active component in this storytelling process. This means that a narrative is an interactive process of constructing and interpreting experience with others. A thematic narrative analysis will be used. This kind of narrative analysis tries to identify key themes within a narrative or identifies themes that are common to all stories within the set (of narratives) (Sally Maitlis, 2012). In this study the aim is to find out which themes can be found in the psychological contract of PhD candidates and which themes are related to the decision for a (non-) academic career.

First, open codes were given to the parts of the data that focused on the psychological contract of PhD candidates about their career, the different stages of the PhD trajectory and the choice for a (non)academic career. Then these codes were clustered into categories with the same theme (appendix C). The analysis revealed the themes that make or break the psychological contract of PhD candidates when it comes to their career development. It also showed whether these themes happen in a certain stage of the PhD trajectory.

3.6 Reflexivity in the narrative approach

According to Essers (2009) narratives are co-productions of the interviewer and the interviewee. She describes that the content and the interpretation of the stories are affected by

this co-production, both in the data collection and the analysis. “Within the collection, interpretation and writing-up phase, both parties control the interview situation and shift between different roles and power positions. It is difficult to balance these power positions in the research process, and I argue researchers should not strive to do so” (p. 176). She states it makes more sense to reflect on these roles and power positions in favour of in-depth ‘situated knowledge’. She says that situated knowledge not only acknowledges our partiality and how it affects our research, but also accounts for this partiality in the text in order to make the text more comprehensible and responsible.

3.7 Personal reflection

I have taken reflexivity in consideration when doing the interviews by trying to ask open and neutral question in order not to steer the respondent in the direction of a certain answer. However, the questions that I asked or did not ask have an influence on what the respondent has told me. I found it difficult in the beginning whether I should be the impartial researcher or the empathetic and confirming researcher in my reactions to what the respondents told me. Because I wanted to give the respondents the feeling that they could share everything, I wanted to confirm that their situation was hard, difficult or fun. But I also did not want to be suggestive or judgemental in my reactions. I struggled less with this when I had done more interviews and found a balance. During the interviews I tried to summarize in one sentence what the respondent had just told me in order to confirm that I understood him or her correctly. This often led to the respondent telling me even more.

I have learned that it is not always possible to ask the respondents questions directly, because these are matters that are not in the top of a respondents mind or are implicit beliefs. The psychological contract is such an example and this meant that I had to read between the lines and determine in the analysis of the transcripts when a respondent spoke about their psychological contract. I used the following rules to determine whether a respondent spoke about their psychological contract: a respondent thought that somebody should have done something for him/her, a respondent missed something in their PhD experience, a respondent thinks that something should be different. Even if a respondent does not seem to experience breach of psychological contract about a certain matter, it could be a bonus or fulfilment of the psychological contract when it does happen.

Both the data collection and the analysis have showed me that indeed both the interviewer and the interviewee play their role in producing the narrative.

4. Findings

In this chapter I will analyse how important aspects of the PhD trajectory are experienced, the phases that can be distinguished in the PhD trajectory, what is in their psychological contract, and what determines the career choices of PhD's.

4.1 Aspects of the PhD experience

In order to understand what PhD candidates go through in their PhD trajectory, it is important to discuss some factors that make up that experience. The most important factors that give context to the PhD trajectory are the relationship with their supervisor(s), their thesis, mental health, and the position of internal and external PhD's.

The relationship that PhD candidates have with their supervisor impacts the experience of the PhD trajectory, both positively and negatively. PhD candidates describe that they have an asymmetrical relationship with their supervisor. They are in a vulnerable position, because of their dependence on their supervisor. This can be experienced as stressful. PhD candidates appreciate it when their supervisors give help and expertise, give the right amount of freedom, are available, take PhD candidates seriously, are able to push PhD candidates at the right time, care about the well-being of the PhD candidate, and when the personalities of PhD candidates and supervisors match. PhD candidates find it difficult when they perceive that supervisors push too hard, when they are unavailable, when they give little (substantial) feedback, when they give too many ideas that make the PhD candidate lose focus and when they do not fully get the topic or research goal of the PhD candidate. Many PhD candidates indicate that they struggled to find out what the roles and expectations in this relationship are.

PhD candidates mention planning and publishing as important factors when it comes to doing research and writing a thesis. When there is a clear plan for the project it can lead to a smooth trajectory. However, finding the right respondents can take longer than expected or it is difficult to find the right set-up of the thesis. PhD candidates also have or take on a lot of responsibilities aside from their research. When PhD candidates have a teaching obligation this usually takes more time than officially noted and this gets in the way of doing their research. Many PhD's do their research within a bigger project, which means that they also have to spend time on that project. These obligations and other activities can make it hard to finish everything on time and to have a healthy work-life balance. Another thing that messes with the schedules of PhD candidates is the pressure to publish articles in top journals. The

process of writing articles, getting them back and having to rewrite them again takes up a lot of time.

PhD candidates have different opinions about mental health. The PhD trajectory has been described as:

“Our lives as PhD researcher, it was like a swinging between a complete lack of confidence in oneself and like this sense of being kind of God, I mean, I can do whatever, like superpower.”
(R7)

Stressors are: having too many tasks, work-life balance, pressure to publish, feeling secluded or alone, having to finish a PhD in your own time, no variety in tasks and the vulnerable position of PhD's. There are also some boosters such as an interesting research topic, variety in tasks, support from family or getting confidence in oneself after getting a paper published. PhD's also did a lot to keep themselves mentally healthy, such as keeping tabs on the amount of hours they worked in order to make sure they did not work too much and speaking up about their limits and setting boundaries. Workstyle is also mentioned as a factor for the state of one's mental health. The work conditions of a PhD would give enough space to be mentally healthy, but how one deals with the work that needs to be done determines one's mental health. Some foreign external PhD candidates stated that they did not understand why many of their Dutch colleagues seemed so stressed out. They explained this difference mostly by a cultural difference.

As mentioned before, PhD candidates in general have a vulnerable position. However, both internal and external PhD candidates notice the difference between two types of PhD. The foreign external PhD candidates have an extra vulnerable position, because of their dependency on their job in order to be able to live and work in the Netherlands. They depend more on their supervisors, because of this. There is also a difference between the support and information external PhD candidates can get. This is illustrated by an internal PhD candidate who thought that external PhD candidates have less quality than internal PhD's and that they are used by the university as a way to earn money.

4.1.2 Phases of the PhD trajectory

In order to find out whether PhD candidates in the Dutch context also experienced phases in their trajectory and if so, how they experienced them, PhD candidates were asked about this topic. This matters, because it shows whether or not there is a change in the perception of the

PhD trajectory and whether there is a bigger focus on career development and career choices in certain phases.

Most PhD's refer to research phases when asked whether they recognized any phases in their trajectory. Some also mentioned a development in their socialization and their own professional development.

“I think that the thing that went best in in the in the overall trajectory was that like step by step, at a certain point, I realized I was capable of doing research, which sounds weird, but that was the feeling somehow. [...] at a certain point, especially when I started writing, I realized that I had something to say and I was capable of saying it.” (R7)

This quote shows an example of a professional development in the role as researcher. Most PhD candidates state that the goal of a PhD trajectory is to learn how to do research independently, without supervision. In this quote it becomes clear that the PhD candidate feels that he acquired the skills that he needs during his trajectory.

Here I will analyse the experience of the research phases. Some PhD candidates said that there was not one specific phase that was the most difficult, but that each phase had its own challenges. This shows that each phase is different and should therefore be discussed separately. The first phase is mostly described as the phase in which the research is prepared and explored, which will therefore be called *the exploratory phase*. The middle phase is the phase in which the data collection takes place, the first papers are written and published. This phase will be called *the collection phase*. In the last phase PhD candidates also publish papers, perform the data analysis and write their dissertation and start to look for their next job. This phase is called *the closing phase*.

The exploratory phase

The exploratory phase can be experienced as difficult and confusing, because everything is new and everything has yet to be figured out by the PhD candidate. This applies both to the work that needs to be done and their social environment.

“So, I thought that the beginning was more difficult, but I think that has to do with inexperience and that it is a new setting, a new situation and a bit insecurity. Both situationally and personally.” (R5)

However, some PhD's enjoy this time because it is a time where they feel no pressure yet. There is still time to figure everything out and it feels like fun, because there is hopefulness and motivation because of all that can be achieved.

“In the beginning, I'm really, really, really ambitious at the beginning and full of curiosity and have the feeling that, OK, I can really achieve a lot and with a lot of passion.” (R6)

The collection phase

The collection phase can be characterized as a phase where PhD candidates have familiarized themselves with the situation on the one hand. PhD's have gotten to know their supervisors and there is a relief of pressure after the assessment interview or the proposal defense. Which is the moment that PhD candidates hear whether their research proposal is sufficient.

“Also because, after eight months there is an assessment interview. Then you'll know whether you can actually sit the rest of your PhD out. Well, sitting it out sounds a little passive, but whether you will definitely finish it or not. You also get to know your promotor and daily supervisor better along the way. That was very nice in my case, because they are very accommodating, are fine with everything, so that helps too to get the pressure off a bit.” (R5)

On the other hand there are new challenges such as keeping oneself motivated, which PhD's refer to as the “PhD gap”. In this “PhD gap” PhD's feel a big drop in motivation, question themselves and whether they should continue their PhD.

“People are always talking about the PhD gap. [...] A drop of motivation just about in the middle.” (R2)

“I think in the middle, there was a moment, OK, let's say that, approximately after one and a half year, I really wondered whether to drop it. [...] I felt like, does it really makes sense what I am doing? Am I capable of doing that? You know, like these big questions that everyone has, like from me, they came right in the middle of my path.” (R7)

The quotes from R2 and R7 show that PhD candidates start to struggle with their motivation and whether they feel that they have the ability to do what needs to be done. This can

probably be explained by that the exploratory phase is over and that PhD candidates actually have to start with their research, meaning that they have to collect data, write articles and start publishing. At this point PhD candidates will start to see whether it is good enough what they were planning on doing. Which can be demotivating if one really questions themselves. This is related to the challenge of getting articles published, mostly in top journals. Depending on the research program, it can be a requirement to publish a number of the articles that the PhD candidate has written.

“And somewhere in the middle you think: oh, well, I should publish articles at some point. That’s when the pressure comes all at once, at least I felt quite some pressure like: now something has to come out of it and there needs to be started with publishing things.”(R2)

This quote shows that the requirement to publish articles can give pressure. Not only to actually start writing articles, but also to write them good enough to be accepted by journals for publication. Some PhD candidates stated that they needed to publish their articles in top level journals, which means that the pressure is even higher. It is harder to get published in top level journals than in other journals.

The closing phase

The closing phase is both easier and more difficult in comparison to the other phases. It is easier because some PhD’s feel that they have gained experience, know what they are doing and where they are going. They have gained confidence.

“At least now I know now in which direction it has to go. Now, it is the final sprint and at this moment, I know, the articles, which I want to publish, where I have to publish them, I know what they are about. It only has to be finished, but there is a route mapped out and that makes it a lot more bearable towards the end.” (R2)

“And also in my functioning, because at this moment I am really like: Okay now, now I feel like a researcher.” (R2)

However, the closing phase is also considered busier. Work is piling up because of papers that are coming back with feedback and they need to be altered, while PhD’s are also working on other papers and other activities. One struggles with getting their papers published.

“And yes, naturally the data adds up and you write in the meantime. For example for step one I am writing an article, step two and then you hand it in. But it often comes back with feedback again or you get it back without any feedback, then you have to resubmit. So actually, the longer you are working on it, the more the work keeps piling up.” (R9)

The closing phase can be emotionally difficult because there is “no longer the fun of being in the field”, but one is working alone on the analysis and the writing of the thesis. Doing the same thing over and over again feels draining.

“That step, is most of the time for many people quite a, can be a struggle. And it is also true that there is no longer the fun parts of being able to walk around in the field and being able to talk to people. It is mostly writing by yourself very much.” (R10)

“And till the end, everything, all the data are just there. And my job is to write, to make the paper and getting the paper published. For this period it is hardest, [...] because when you, you did the similar task time and time again, day after day, the same data, the same theory. Just to try to make it better, I'll try to make it more understandable. It is, it will sometimes make emotionally, just not that like to do it.” (R6)

Another thing is that PhD's are looking for their next job. While some already have a job offer ready, others have the stress of trying to find something while time is running out.

“But for the later stage, I also need to think about: OK, my contract will end, what is the next step? So it is also another burden why I said the final stage was harder.” (R6)

It is also important to mention that some PhD candidates took longer to finish their PhD than originally planned, because this has consequences in terms of employment and income. Some of them got an extension of their contract, but others had to finish their PhD in their own time. This can lead to new challenges and can therefore be an extra phase of the PhD trajectory.

“And yes, I think, I don't know if I thought it was the most difficult period, but yes, you are past your contract date, so then you have to do it in your own time and you're not getting paid for it. So that maybe takes more mental energy or something.” (R3)

“And now all the way at the end, the case was that my promotion contract had actually ended, but that my book wasn't finished yet. So they extended my contract in exchange for

teaching, but that is so much teaching that the work that needs to be done for the dissertation needs to be done in the evening.” (R1)

Because PhD candidates no longer get paid to work on their dissertation fulltime, the struggle in this phase is to find both the time to finish one’s PhD and to get an income at the same time. The quote from R3 shows that one way to still finish your PhD can be to get unemployment benefits and work on the thesis fulltime. She does say that that takes more mental energy than getting a contract extension. The quote from R1 shows that one can also finish the thesis next to one’s regular job, but that this comes down to working on it on nights and weekends. The issues with these ways of finishing a PhD is that unemployment benefits or the energy to always work on nights and weekends do not last forever.

In conclusion, three phases in the PhD trajectory can be distinguished, plus an extra phase if one has to finish their PhD in their own time. In the next subparagraph it will be discussed why PhD candidates initially chose to do a PhD and whether their career plans changed over the course of the PhD trajectory.

4.1.2 Career plans

PhD candidates started their PhD trajectory for various reasons, but three categories can be distinguished. First, because of what the PhD offered the PhD candidate in that moment. These are things like financial stability, a nice beginning of their career, an interesting project or an opportunity to do research. The second category is that the PhD can offer the PhD candidate benefits in the long run, such as research and analytical skills, and the chance to strengthen their network. The last category is PhD candidates who want a doctoral title, because it is a requirement for an academic career or because it gives them better career opportunities outside academia.

However, how PhD candidates look at their careers can change during the PhD trajectory. Sometimes working in academia did not seem like a serious option, until PhD candidates got some external validation because their paper got published for example.

“So that is a good journal and then I got revisery submit, that is when I thought: Okay, so you have some external validation I guess, what you are doing is interesting. [...] So then you have the chance all of a sudden, 100% certain almost, that if you want it, you can do it.” (R11)

Some PhD candidates thought they did not want to work in academia, but found out that it is better than expected or they chose to get over the issues they have with the academic world. These issues will be discussed in more detail in paragraph 4.2.4.

“That is when I thought: doing research may not be so crazy after all. And now that I am doing this for the fourth year, I actually really like it, it almost surprised me how much fun it is.” (R9)

“And yes, so now I am happy to stay in academia, well, not happy, but now I stay, anyway I want to try in academia, let me put it like that.” (R1)

The quotes from R1, R9 and R11 show that experiences throughout the PhD trajectory can change how one feels about an academic career.

PhD’s use a range of sources to get more information about career options, such as job openings, courses, alumni, professors and their network. Some PhD candidates also found out that networking turns out to be an important source for job opportunities and felt that they missed out, because they do not have enough relevant contacts to really profit from it.

“So I do not have enough networking to support me or to provide me working opportunities. And if I could talk to more people, I’ll build more networking during the passage period. Maybe I could have an easy life now to find a new job. That is my guess.” (R6)

Another important source of information was the supervisor of PhD candidates. Many PhD candidates spoke with their supervisor(s) about their future careers. Some supervisors offered PhD candidates advice, or actively asked them what they wanted after their PhD to decide on a course for the PhD trajectory itself, offered them a next position as postdoc or suggested to apply for a grant.

“So I think that I mostly get that information from my promotor now and also keep getting, and that she is also really a mentor in that sense.” (R5)

The quote from R5 shows that a supervisor can also be considered a mentor, which means that the relationship with one’s supervisor can be important for the career development of PhD candidates.

In conclusion, the factors that give context to the PhD trajectory are the relationship with their supervisor(s), their thesis, mental health, and the position of internal and external PhD's. The PhD trajectory has phases and PhD candidates experience different challenges and triumphs with each phase. Their experiences throughout the PhD trajectory, the information they get and the people they come into contact with have an influence on how they think about their careers. In the next paragraph the psychological contract of PhD candidates and how this influences their career choices will be discussed.

4.2 Psychological contract

In this paragraph the psychological contract of PhD's will be discussed. The psychological contract is defined as “an implicit understanding (as opposed to written or legal contracts) of give and take between two parties in a relationship. Psychological contracts are based on perceptions of a reciprocal arrangement individuals have with each other” (Bordia, Hobman, Restubog, & Bordia, 2010, pp. 2361). The content of the psychological contract about career development is very personal, meaning that it depends on PhD candidates' preferences and opinions what they want, need and expect from their career development. Breach of the psychological contract on a personal level does not seem to have an effect on career choices, but the critique that PhD candidates have on an academic level can be reasons to leave the academic world after their PhD. This depends on their reaction to the breach. These findings will be discussed in more detail in the following subparagraphs. First, the content of the psychological contract about career development is discussed. The next subparagraph discusses psychological contract breach. After that the reactions to breach are discussed. Lastly, critique on the academic world will be discussed.

4.2.1 Content psychological contract career development

Here it will be discussed to what extent PhD candidates felt informed and prepared for a career after their PhD and how they think this preparation should be. PhD candidates have different opinions about how prepared and informed they felt for their career choice after a PhD. Some say that there is a complete lack of information and preparation, while others say that there is a lot of information available.

“They are doing quite a lot, and at the graduate school and within the hospital and the university, just many information days or for example, during a congress, at a certain session, that you get to know more about: well, for example what it is like to

look for grants for a postdoc or on the other hand, what other positions are there?”
(R3)

“You think be informed by some by universities, et cetera? Oh, yeah, well, I think this is something completely, you know, I really missed this. It's lacking, completely lacking. Both in [city] and in Nijmegen. It's like: okay, you're done, good luck.” (R7)

The quotes from R3 and R7 show a big difference in their experience of available career information. These PhD candidates followed their PhD trajectories at different faculties, so this could be the reason for such different experiences. But another factor could be what is actually needed by the PhD candidate. Some find it enough to get some information about career options at the introduction day, while others need more or different information.

“I don't have some sort of point at the horizon that I want to reach, but I am more like I'll see where life takes me. [...] I did not need more information, so I thought it was fine to hear just a little at the introduction day that: so many people will work in business, or will have government jobs or do something completely different.” (R4)

“So if I could give some suggestion for the university, maybe they should think about for the student, for the PhD from the different disciplines, they have the different career needs. And if they could provide some individual course or some programs for social science, especially our management, it can be better.” (R6)

The quote by R4 shows that the psychological contract is also influenced by personal traits. This PhD candidate does not want and need a lot of information to feel satisfied in career information and therefore does not expect a lot from the university. PhD candidates who need more information or preparation, would not feel satisfied with this amount of information. The quote from R6 shows that the problem may also be with the kind of information that is presented.

It is also important who is being held responsible to get the information to the PhD candidate. Some PhD's take full responsibility themselves and do not expect anything from the university in this respect.

“I find that a difficult question, because on the one side you know, I mean the university is there to get your PhD and what you do after that is your own business. It is not like when you work in a company that they will help you get away, so in that sense I do not expect from it.” (R2)

Another opinion is that the supervisor plays a role in this and has some responsibility for it.

“I think a little bit of both, of course you have to think about it yourself, but you can also do that right there and then when your promotor asks about it, that is how it went with me. Yes well, everybody has different ambitions, that is something they know already. But you have to discuss it. I think it is a little lazy when a promotor says: nah, it is your problem. Because, of course, a PhD trajectory is not the same for everyone.” (R11)

Other PhD's also feel that the university plays an important role and that they should inform and prepare PhD candidates for their careers.

“But you're on your own after after you finish. And this is a this is a problem, I'd say. And you need to reinvent what you're doing. [...]so I think that that would be important for universities to prepare you on that, but I would say that besides preparing you in that, it would also be important to create actual opportunities for you..” (R7)

These quotes from R2, R11 and R7 also show that who PhD candidates hold responsible to give them career information is a personal opinion that will decide which party can fulfil or breach their psychological contract in this aspect.

There is a difference between PhD's who think that the university should prepare for both academic and non-academic careers and PhD's who feel that there should only be a focus on academic careers.

Principally, I have to say no and the same goes for our bachelor and master degree. Those do not educate for a certain profession, but they are degrees that teach you, bluntly said, a skillset or certain knowledge. [...] It isn't the task of the university or promotor, or whoever, to prepare the PhD candidate for a job outside. That is my principled standpoint.” (R1)

“That is however, not very pragmatic, so I definitely see the value, like we just observed that so many people will work outside academia. It can definitely be useful to follow a course one time on how do I write policy documents or whatever.” (R1)

The first quote from R1 shows the standpoint that principally universities should only focus on career information and preparation, because the point of a PhD trajectory is to get an academic skillset. However, the second quote from R1 shows that it would be practical to also have some skills that prepare PhD candidates for a career outside academia, because many PhD candidates will not work in the academic world. The two opposing standpoints show why PhD candidates can have a preference for one or the other. Here too, a personal preference will make up the content of the psychological contract.

4.2.2 Psychological contract breach

In this subparagraph it will be discussed in which situations PhD candidates experienced breach. PhD candidates had issues with the quality and availability of supervision, not receiving a reference letter (yet), punctuality, a lack of support and not being taken seriously, no care for one’s well-being, and not getting the promised contracts. PhD candidates have psychological contracts with different parties, such as: the university, the faculty, the department, a supervisor, the head of department or a counsellor.

“Yes, especially because you put a lot of effort in yourself to just doing your job right, or at least for me, to do it right and to promote the university wherever I can at conferences and with courses and to provide good education, to keep those standards high. And that is when I think, well, you don’t get much more than your salary in return actually. That is a pity, a bit of acknowledgement I think.” (R2)

This quote from R2 shows that the psychological contract is an exchange relationship. The PhD candidate works hard for the university and wants to see the efforts that he puts in returned. When the PhD candidate does not, he is disappointed in the university. In other words, his psychological contract is breached.

Hauw & Vos (2010) have described seven types of employer obligations. These are career development (e.g., opportunities for promotion), job content (e.g., autonomy at one’s job), social atmosphere (e.g., good relationships between colleagues), financial rewards (e.g., attractive rewards packages), and work-life balance (e.g., respect for one’s personal situation),

training (e.g., financial support for training courses) and job security (e.g., employment with long-term perspective). This division of employer obligations has been applied to the data of this research and the analysis showed that psychological contract breach happened with all seven types of employer obligations. This will be discussed below.

In the area of *training*, PhD candidates had breached psychological contracts because they did not get enough quality and availability of supervision, and they were not offered enough structure and writing help.

“That is also a thing, but there are no writing courses at this university.” (R8)

“I also didn’t have such a good idea of how you write a paper – and I also missed some guidance there, I must say. [...] Because it is very often like, yes, how do you write a good sentence and stuff, but not really like, say, there is never an explanation for how you go from an idea to paper.” (R2)

“And I often have, well, not conflict with my daily supervisor, but a lot of irritation. Every, everything that goes wrong in my research, that produces delay, that is often because something is not in order from his side, that I have to wait on something.” (R5)

“And that was hard for me too, that he didn’t get like: okay, I haven’t spoken to him in four weeks already, that is not very convenient. Maybe I should make more time to speak with my PhD.” (R2)

“So what I thought was a pity, what I think is a pity is that the supervisors gave little structure in the guidance.” (R2)

These quotes have in common that the respondents feel that they missed something in their guidance and training as a PhD candidate, whether that is structure in the PhD trajectory or courses on how to write properly. What I analyse from these quotes is that PhD candidates take this trajectory seriously and that they want help to get through this trajectory as well as possible.

When it comes to the employer obligation of *social atmosphere*, PhD candidates experienced breach when they could not count on made appointments, when there was a lack of support (for external PhD candidates) and when they were not being taken seriously.

“The one from the university, I had a good relationship with her, but I have had very often, that is on the smaller scale, that I had an appointment with her and that she was either too late, or didn’t show up or let me know after 15 minutes: oh, I am not coming. Yes, that is a little, it is failing a little bit, because I don’t mind if it is cancelled, but you want to know beforehand.” (R3)

“In my previous PhD, in the sense that I didn’t, I still have a very good relationship with my old supervisor, but I felt very isolated from the university. That I barely had any contact with her, was maybe also a little bit my fault, but the obligation to give me support too as an external PhD candidate, that is what I felt, that they left me out of it.” (R10)

“So that is a very asymmetrical relationship. I am sitting there across from some professors and they like: yes, too bad, you know, we don't make the rules either, it is not our responsibility. While you are saying: Yes, but they just didn’t read the rules right. Then you are just being taken seriously.” (R11)

What I analyse from these quotes is that a good social atmosphere can be diminished when PhD candidates feel that they are not taken seriously. The quote from R3 shows that smaller issues can become bigger when it happens all the time and that the PhD candidate is not taken seriously enough to show her the respect of communicating that the made agreements will not be kept. The quote from R10 shows that he is not taken seriously enough in his role as external PhD candidate to give him the needed support and communication. R11 does not feel taken seriously as a PhD candidate, because the professors sweep his concerns under the rug.

In the aspect of *work-life balance*, breach was experienced when the PhD candidate felt that there was a lack of care for his well-being.

“Certain scores and then all the annual assessments, instead of asking how you are doing, they go through all kinds of excel sheets to see how well you have performed. And my first annual assessments were like that, but I said that I dont want to have annual assessments in that way anymore. I don’t think it is a way to talk to each other and judge someone like that.” (R1)

The quote shows that R1 finds that annual appraisals should be about how he is doing and not about numbers and excel sheets, which shows that it important to R1 that his employer cares for his well-being.

PhD candidates experienced breach of the psychological contract in the area of *job security* when it came to their contracts and legislation.

“But at this moment, I think, he saw an opportunity to do some shit to [promotor]. Only because, they always have problems, because [chairman] is always very authoritarian and [promotor] does not like that and he lets him know it. So the way to have revenge on [promotor] was to say a few months before my contract had to be signed: oh, I won't do it anymore, I am no longer in favour.” (R8)

“They were, we have been talking about the contract that I would get as a university teacher for a long time, that has been going on for a long time. [...] But then HR from our faculty refused to approve my contract as a university teacher, because the manuscript committee verdict wasn't in yet.” (R1)

These quotes show that PhD candidates feel breach in their psychological contract when they were promised another contract after their PhD trajectory and they do not seem to get it anymore or it is delayed. These contracts were explicitly promised to them and it threatens their livelihood and job security if this promise is withdrawn.

In the area of career development, a breach of psychological contract was experienced when a supervisor did not respond yet with a reference letter.

“And it's for a long time I haven't received, even though I have already provided a draft reference letter for her. So it is not an obligation, because nobody saying: well, supervisor have the obligation or have the duty to provide a job letter. That seems, well, but but sometimes they will provide a letter in time, but I haven't received. So I'm a little bit, I'm not sure whether I should send an email, maybe later, that in, I'm not, I'm a little bit disappointed on this issue.” (R6)

This quote shows that her supervisor did not live up to the expectation of returning a reference letter on time, which shows that a breach of psychological contract can also occur when fulfilment of an expectation is delayed. Other breaches of psychological contract in this area occurred when PhD candidates felt that they did not get enough or the right kind of career information and preparation, as discussed before in paragraph 4.2.1.

PhD candidates did not only speak about their own issues when they were asked when they thought that their employer failed to fulfil obligations, but also referred to the issues of other PhD candidates.

“And that is what she did, but he didn’t respond to her emails at all. So he didn’t do anything for her and I thought that was terrible. So I have gotten really angry about that. I made sure that the counsellor was replaced.” (R1)

“But also because I knew that guy. So I thought it was stupid for him. In the end he did a PhD position, but he didn’t work for six months, so he wouldn’t get a fixed contract. But that didn’t make any sense, because they didn’t even have to give him a fixed contract, so they just didn’t understand the regulations.” (R11)

These quotes show that the psychological contract of PhD candidates can also be breached by what happens to other people in their organization, in these cases colleagues. Sometimes PhD candidates also got involved in the situation themselves and had emotional and behavioural reactions to this breach of psychological contract.

4.2.3 reactions to breach

Here it will be discussed how PhD candidates react to breach of their psychological contract. The reactions to breach range from adjusting their own psychological contract and trying to work around the problem to getting angry and speaking up to someone about the issue. The reactions are not always immediate. Some PhD’s had as a first reaction to try to work around the problem, but speak up later when the problem becomes too big or takes too long.

“It is a significant problem and it is more, I share it with my promotor, because it - I have shared it only one, two, three weeks ago, but it is a problem that has bothered me since day one. It’s just, I don’t want to be a snitch, to put it like that.” (R5)

In this case the PhD candidate did not speak up about his problem, because he did not want to be a “snitch”. Other PhD’s stated that it did not occur to them that speaking up was an option or they did not feel that they were in the position to say something about it.

“And I am, I feel that it is not my place to make a remark about that. I mean, maybe that is me, but I thought it was a little weird to tell my supervisor how he should do his job.” (R2)

The ones who speak up about their problems seem to solve the problem or at least make sure that it does not have any concrete consequences.

“So, in the end it didn’t have any concrete consequences for me, except for a lot of stress and frustration in that moment, and because I already had it up to here, I could no longer keep myself from sending angry emails.” (R1)

This quote is an example of a situation where a PhD candidate spoke up about the problem and by doing so, he made sure that the problem was solved. So apart from a breached psychological contract, which was a real consequence, he was able to make the actual problem go away with his behavioural reactions, such as talking to right people and sending e-mails.

Speaking up about larger, structural problems does not have the same effect.

“And I addressed that during the department meeting and [name] immediately swept it under the rug. Says: yes, we will not be discussing this, next!” Yeah, so at that moment I really thought: okay, I am not being taken seriously here, I will never go to this again.” (R11)

The quote from R11 shows that speaking up about larger issues can even lead to a contract breach in itself, because the PhD candidate is not taken seriously and nothing is done about the problem that is being addressed.

4.2.4 Critique on the academic world

Here it will be discussed that PhD candidates also experience breach of psychological contract on a larger, structural scale. This is breach of the psychological contract on the academic level, whereas the breach that was discussed in 4.2.2 happened on a personal level. Because breach on the academic level cannot easily be solved, these can actually be deal breakers to work in the academic world. The biggest critiques are the work pressure, the idea of scrambling for research, that only the top journals seem to matter for publishing, that these top journals do not say anything that matters in the real world, that the PhD candidate is being exploited and that there is a big difference in the support for internal and external PhD candidates.

Multiple PhD candidates stated that the high work pressure is a reason to not work in the academic world.

“Because in the research at my department, there are a lot of senior researchers that work a lot more hours than they are getting paid for I think. And I wouldn’t want that myself. I am working a little more here and there too, but I am not planning on doing that for the next 30 years. [...] I don’t agree with it and if I would continue in academia, then I would very strictly pay attention that I don’t take too much on my platter.” (R4)

This quote shows that the amount of hours that some researchers make and that they probably also do not get paid for that amount of hours, scares this PhD candidate off to pursue an academic career. The experience of doing a PhD trajectory and seeing people who work in academia making so many hours, breaches the obligation of a *work-life balance*. Meaning that PhD candidates do not expect that private time will be respected.

Another critique is the idea of scrambling for research grants.

“Because you can apply for a lot of grants, but get nothing. And then you lost all that time with making a plan and discussions, and involving people and submitting. And then it gets denied and you get nothing. And that, yeah, is a bothersome system. There are a lot of people in the department that don’t have fixed contracts and are very dependent on that. So if you don’t bring in any grants, you have no job.” (R4)

“So I have done that a lot, I never got money for a grant myself. So that is also a reason that I don’t want to stay in academia, because I think: it is the thing where you have to pay yourself.” (R8)

These quotes show that the amount of time and energy that it takes to write grant proposals and what you can get for it in return, is often not in balance in the eyes of these PhD candidates. They perceive the *job security* and the chance to get enough *financial rewards* so low, that they would rather not work in academia.

Something that can bother PhD candidates when it comes to their *job content*, is that only the top journals seem to matter for publishing, but that these top journals do not say anything that has an impact on society.

“But the point is, I think you can't measure everything. If you're trying to measure my quality as a scholar by the number of articles I published, that's a big problem for me. I don't like it. I think it's a wrong system and that's it.” (R7)

“But if you’re just going to repeat what somebody else has already said, you create, what is known as noise. That’s just noise. More science from lesser quality. And then, that makes it harder to understand: which are the texts that are really important to have as the basis of a profession. If you want to study a profession, which authors and books. So that’s what you see: bullshit, bullshit, bullshit articles.” (R8)

“ It feels like a totally useless activity, because you know, I have already published 3 articles, but who does something with that?” (R4)

These quotes show that some PhD candidates do not agree with the system in which they perceive that their worth as a scholar is defined by the number of articles they have published in top journals and that these top journals have many articles that say the same things over and over again. What I analyse from these quotes is that these PhD candidates want to write meaningful articles and that they want to see quality over quantity.

Multiple PhD candidates stated that there is a big difference in the support for internal and external PhD candidates.

“But this, even more as an external PhD candidate, for whom they don’t have a lot of responsibility... because it’s external, they do the minimal amount [...] but for both universities the support was the bare minimum for what an external student could get. (R10)

This quote shows that the PhD candidate feels that he did not get enough support, because he was an external PhD candidate. In this case it even led to him quitting his PhD trajectory before completion. When this difference in support is noted by PhD candidates this can lead to breach in the areas of *social atmosphere* and *training*. What I analyse from this situation is that there might not only be a difference in the available support of internal and external PhD candidates, but that the support for external PhD candidates may also be too little to lead to a successful PhD trajectory.

A critique that can breach many types of employer obligations is corruption and exploitation in the system. This can affect *job security*, *financial rewards*, *job content*, *work-life balance & social atmosphere*.

“ But if you don’t say anything about it, then you’re just being exploited you know. Because they’re letting you do stuff that you’re not allowed to.” (R11)

“Just in the kind of regular oppression, that you see like: hey you, do what I want. That is what supervisors most of the time say to other people: do what I want, you can’t research that, my name has to be on it even if I haven’t done anything, stuff like that. I think that’s corruption.” (R8)

“Then you are not being taken seriously, but that’s not purely something that you come across as a PhD candidate. I’m often not taken seriously, plenty times and the same goes for colleagues. So that remains a thing and it has nothing to do with the promotion itself. [...] It’s like, institutionalized corruption.” (R11)

These quotes show that some PhD candidates experience forms of corruption and exploitation of employees in the academic world. Attempts to speak up about it by PhD candidates have not been taken seriously. Which then leads to an even bigger disappointment in the system.

These issues can be deal breakers for PhD candidates to work in the academic world, but not necessarily. Some PhD candidates decided to try to change the system from within.

“And then I decided that I wanted to try and that I wanted to take a stand for it, all the other stuff that I said before, I would try to change that from within.” (R1)

While others try to find projects or people where these problems do not occur.

“If I have to say what is important for me, it is the project and the people, if I like that, then yes.” (R8)

Some find that the academic world is just as bad or good as the non-academic world and therefore accept the shortcomings of the academic world.

In conclusion, the content of the psychological contract about career development is very personal, meaning that it depends on PhD candidates’ preferences and opinions what they want, need and expect from their career development. Breach of the psychological contract on a personal level does not seem to have an effect on career choices, but the critique that PhD candidates have on an academic level can be reasons to leave the academic world after their PhD. This depends on their reaction to the breach.

4.3 Career choices

Here it will be discussed why PhD candidates chose for a certain career after their PhD. I found that there are factors that can drive PhD candidates away from the academic world, factors that draw PhD candidates into the academic world and factors that are important for one's career choice, but that can both be found within and outside the academic world.

As discussed in the previous subparagraph 4.2.4, factors that can keep PhD candidates from working in the academic world are work-life balance, the idea of scrambling for money by writing grant proposals and the pressure to publish in top journals and not being able to write about something that has an impact on society.

In contrast, some PhD candidates are drawn into academia, because of the freedom of doing research independently.

“So my supervisors supported my idea and just let me go and I talk with them, my idea and everything just to follow what I planned. I really enjoy this kind of independent feeling.” (R6)

“When it comes to alternatives, I think, that working for a university in my case is a lot nicer, because you have a lot of autonomy, I don't have to get up at nine, and work till five, I don't have to do a whole lot of things, deciding your own research topics, that is at least now the case.” (R11)

These quotes show how PhD candidates can feel the freedom and autonomy that they need in the academic world. The contrast with the PhD candidates who do not feel that they have the freedom to write about what they want, might be explained by the topics that these PhD candidates want to research. Research topics that fit in the scope of the top journals, may get all the freedom, while other research topics and articles “do not count” in the system and that can make some PhD candidates feel restricted. Other factors that draw PhD candidates into academia are an interest in doing research, wanting to teach at the university, and using the just acquired skills.

There are also a lot of factors that PhD candidates want in their next job that are not necessarily related to the choice for an academic or a non-academic job. There are practical issues like job security, needing an income and which jobs are available on the labour market. There is the social aspect in which PhD candidates like to work in a team, want a job in which they work with people or that their career choice depends on the type of people they will be working with. There is a substantive or intrinsic factor which means that PhD candidates want

to get the feeling of doing meaningful work, whether this is achieved in academia or not. Lastly, there is the factor of wanting to do research or something related to research, which can both be done in- and outside academia.

In conclusion, PhD candidates have critique on certain matters in the academic world, but it depends on their reaction to these matters whether these are deal breakers to work in the academic world. There are also factors that draw PhD candidates into the academic world. There is also a grey area of factors that are an important part of a career choice, but these do not decide whether PhD candidates choose an academic career or not, because these factors could both be found within and outside academia.

5. Conclusion and discussion

The aim of this study was to analyse how PhD candidates in the Netherlands experienced their PhD program and which factors in this experience lead to the choice for an academic or non-academic career. How PhD candidates experienced their PhD trajectory and which career choice they made throughout this experience was analysed through the lens of psychological contract theory and led to a better understanding of the factors that make PhD candidates leave or stay in academia after their PhD. First, the phases that PhD candidates go through in their PhD trajectory have been identified. Second, the content, breach and reactions to breach of the psychological contract of PhD candidates have come to light. Lastly, a better understanding of the factors that determine the career choice of PhD candidates was gained. These three findings will answer the research question: “How do PhD candidates experience the expectations and realities of their PhD program that lead to the decision to either leave or stay in academia?” After this, limitations and future research will be discussed and implications for practice and theory will be given.

5.1 Experience of the PhD trajectory

The most important factors that give context to the PhD trajectory are the relationship with their supervisor(s), their thesis, mental health, and the position of internal and external PhD's.

In line with studies in a non-Dutch context (Ali et al., 2007; Weidman et al., 2001) PhD candidates in the Netherlands also identify phases in their PhD trajectory. Most PhD candidates referred to research phases when asked whether they recognized any phases in their trajectory, but some also recognized a development in their own professional development. Phases are recognized in the completion of a doctoral degree (Ali et al., 2007) and a professional development is recognized (Weidman et al., 2007). It was important to see whether and how PhD candidates experienced phases in their trajectory, in order to gain insight in if, why and when their focus shifted regarding their career. The conclusion in this regard is that it differs per PhD candidate when they chose a certain career path. Some PhD candidates have made their choice before they started their PhD and never changed, some find out halfway in their trajectory that they actually have the skills required for an academic job which opens up possibilities and some struggle until their PhD has finished and after to decide whether an academic job fits with their values and job demands. The study by Weidman et al. (2001) describes the stages that PhD candidates go through to form their professional identities. Though it may be true that PhD candidates go through these stages, the findings in

this study show that the last stage in in forming their professional identity does not have to coincide with the last phase of the PhD trajectory. It is true however that PhD candidates focus more on their career in the last phase of their PhD trajectory, simply because they need to find their next job.

PhD candidates started their PhD trajectory because of what it could offer the PhD candidate in that moment, for the benefits of the skills and network that they can use in the long run or because the doctoral title is something that they need for the next step in their career. PhD candidates have various reasons to start a PhD and only the last one has a long-term career plan in mind. How PhD candidates look at their future careers can change during the entire PhD trajectory, just like the study by Helm et al. (2012) showed.

5.2 Psychological contract

The content of the psychological contract of PhD candidates about career development differed in how prepared and informed they felt for their career choice after a PhD. This depends on their need for information and preparation, who they think is responsible to get the needed information to the PhD candidate and whether PhD candidates believe that the university should prepare for just an academic career or careers outside academia as well. This is in line with the described literature in the theoretical framework that also showed some contradicting results as to what PhD candidates want and need in their career development.

PhD candidates experienced psychological contract breach in the areas of training, career development, social atmosphere, work-life balance, job security, financial rewards and job content (Hauw & Vos, 2010). Here I make distinction between obligations on a personal level and an academic level. On a personal level, PhD candidates spoke about what happened to themselves or another PhD candidate. On the academic level PhD candidates spoke about larger issues that they had with the academic world.

Here I will discuss the personal level. When it comes to *training* PhD candidates had issues with the quality and availability of supervision and thought they should have received more structure and writing help. When it comes to *career development* a PhD candidate was disappointed that she did not get a reference letter (yet) from her supervisor. There were issues in the *social atmosphere* about punctuality, a lack of support and not being taken seriously. When it comes to *work-life balance* the issue was that the PhD candidate felt that the employer did not care about his well-being. *Job security* was an issue when PhD candidates did not get their promised contracts.

An unexpected finding was that PhD candidates did not only speak about their own issues, but also referred to the issues of other PhD candidates. PhD candidates did not only tell me about it, but also had an emotional response to the situation and took action when the problem occurred. Which shows that the psychological contract goes further than just what happens to oneself. To the best of my knowledge this has not been discussed in the literature before and may therefore be a new angle for future research of psychological contracts.

On the personal level a reaction to breach that influenced ones career was that one external PhD candidate decided to leave before degree completion. Another reaction was to speak up and therefor prevent serious consequences for one's career choice.

On an academic level breach was found in the employer obligations (Hauw & Vos, 2010) of *job security, financial rewards, job content, work-life balance, training & social atmosphere*. The issues that PhD candidates had with the academic world were: the work pressure, the scrambling for research grants, the pressure to publish in top journals while these top journals have no effect outside the academic world, a difference in support available for internal and external PhD candidates and exploitation of PhD candidates.

There is a multitude of reactions to breach of the psychological contract on the academic level. Some adjust their psychological contract and accept that this is part of the academic world, because it is still the best option for them or because they do not see it being any better outside the academic world. Some have spoken up about these issues, but saw that nothing changed and decided to find projects and people in the academic world where the PhD candidate himself is least bothered with these problems. Others decided that they could still work in academia, because they will try to change the system from within. Lastly, some PhD's decided that the academic world is not for them.

The reactions to contract breach that had an influence on career choices of PhD candidates are in line with the literature. They either spoke up or left (Zhao et al., 2007) or they adjusted the employee or employer obligations in order to create a new balance (Robinson et al., 1994).

The distinction between psychological contracts on a personal and an academic level seems to be related to the career choices of PhD candidates and has to the best of my knowledge not been discussed in the literature on the psychological contracts of PhD candidates.

5.3 Career choices

Many of the findings below emerged from the data and these cannot be linked to the literature. Factors that draw PhD candidates into academia are an interest in doing research, wanting to teach at the university, using the just acquired skills and the freedom of doing research independently. Factors that keep PhD candidates away from an academic career are missing the freedom to do independent research (with an impact on society), the low security of income that comes with writing grant proposals for their own research and work-life balance. Work-life balance was also found as a factor in the study by Van Rooij et al. (2019).

Other factors related to the choice for the next step in their career were practical considerations such as which jobs are actually available, social aspects like wanting to work in a team or with a certain type of people, the feeling that they are doing meaningful work and wanting to do research or something related to research. These are factors that are important to PhD candidates. Because these factors can be found both within and outside the academic world, their career choice is not so black and white, there is a grey area.

In conclusion, there is a bigger pressure to choose a next job near the end of the PhD trajectory, but the view of PhD candidates on their career can change throughout the entire trajectory. The psychological contract of PhD candidates plays a role in their decision to leave or stay in academia, but only on the academic level. Breach on a personal level is not often that severe or long-lasting that PhD candidates base their career choices on it. Career choices are based on whether working in the academic world is something that matches with the psychological contract of PhD candidates. Breach on the academic level cannot easily be solved, which is why this can withhold PhD candidates from choosing an academic career. Psychological contract theory allowed me to differentiate between the expectation, the actual experience and the reaction to this experience. This has led to a better understanding of which experiences and reactions in the PhD trajectory matter in the career choices of PhD candidates.

The implication of this study theoretically is that the career choices of PhD candidates do not seem to be determined by psychological contract breach on a personal level, but on an academic level. This means that PhD candidates are drawn into or driven away from the academic world, because of the system that is in place in this line of work. This suggests a psychological contract between an employee (the PhD candidate) and an entire branch of industry (academia). It could also mean a psychological contract between an employee and their career. Psychological contract theory is about an implicit reciprocal exchange

relationship between two parties. In both suggestions the PhD candidate puts something in, such as effort, time, energy or money and expects something in return. In the case of the industry this can mean work-life balance or job security. In the case of a psychological contract with their career, PhD candidates could expect the feeling of doing something meaningful or interesting. This can be studied in future research.

5.4 Limitations and future research

In this paragraph I will discuss the limitations of this study and give suggestions for future research on the basis of the limitations and findings of this study.

This research was carried out in the middle of the corona pandemic. The original plan was to compare two faculties, but since I got very little response from these faculties I had to broaden my scope and also accept PhD candidates from other faculties. Because of the mixture of faculties in this study, it is not possible to compare the faculties and see if similarities and differences can be explained by the different faculties of which the PhD candidates are a part. However, future research could focus on this aspect.

To get information about the psychological contract of PhD candidates I asked the question: “Can you describe an incident(s) when you thought your employer (or someone from the university) failed to fulfil an obligation towards you?” (Parzefall & Jacqueline., 2015). This question does give insight in situations where PhD candidates felt that their psychological contract was breached, but when respondents do not recall such a situation, information about their psychological contract stays out. Good qualitative questions about psychological contracts were hard to find in earlier research and that is why this is the only question that has been used. If I could have used more or better questions, the data would have been richer and clearer about the content of the psychological contract and if, when and why this changed over the PhD trajectory. My suggestion would be to ask respondents to tell about situations in which they were disappointed in or happy with their employer on some level and then ask why and how they responded. A suggestion for future research would be to find or think of better qualitative questions to ask respondents about their psychological contract.

An unexpected finding was that PhD candidates also answered the psychological contract question with situations in which colleagues had problems. PhD candidates also had emotional and behavioural reactions to this breach of psychological contract. It seems that psychological contracts are also affected by what happens to other people. This should be researched, because it would be an interesting addition to psychological contract theory.

In the past few years multiple studies have looked into the mental health of PhD candidates in the Netherlands and Flanders (Levecque et al., 2017; Meijer et al., 2018; Van Rooij et al., 2019). This topic was also discussed with the respondents in this study and two of the three external and foreign PhD candidates stated that they did not understand the high percentage of mental health issues of PhD candidates in the Netherlands. The third external foreign PhD candidate stated that her mental health was fine because of the support from her family, which is something that no other PhD candidate mentioned. These differences could for example be explained by cultural differences, difference in position of internal and external PhD candidates or simply one's personal context. In future research it would be interesting to look into what could be an explaining factors.

5.5 Practical implications

Now it has come to light which parts of the psychological contract are also factors in the choice for either an academic or a non-academic career on a small scale, research could be done on how many PhD candidates actually experience the same on a large scale. These findings could be used to give advice to organisations that have a say in these matters, such as governments or university boards.

One problem with the bigger, structural issues that PhD candidates have with the academic world, is that they do not feel heard and that nothing is being done about these issues. It is likely that when that PhD candidate speaks up, he or she is the only one complaining about it and that one person is not going to change the system. Universities could therefore use this information and make a communication channel that PhD candidates can send their ideas and complaints to anonymously. This channel could actively ask for input from PhD candidates and other academic personnel as to know what could be done better on a structural level.

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Appendix A

Operationalisation

Concept	Dimensions	Indicators
Verloop PhD traject	Fases	Van wanneer tot wanneer met wie waar ben je mee bezig vertraging
	Ervaring	Positief/negatief Thesis Mentale gezondheid
	Begeleider	Persoonlijkheid Kennis en vaardigheden Communicatie en coaching
Psychologisch contract	Inhoud	Verwachtingen/beloftes
	Partijen	Begeleiders docenten universiteit Externe partijen
	Breuk/vervulling contract	Emotionele reactie Gedragsreactie
Carrièrekeuze	Informatie	Bron Verandering?
	Voorbereiding	Career service begeleider docent
	Ervaring PhD	Positief/negatief
	Arbeidsmarkt	Banen beschikbaar

Topic list

Introduction

Hi,

Welcome, good afternoon. Thank you for helping me. I just saw the consent form, the colour is fine, thank you.

I'll briefly explain it again. My research focusses on how PhD candidates experience their PhD trajectory and which factors lead to the choice for either an academic career or a career outside academia.

In this interview I would like to talk about how you experienced your PhD trajectory and what your ideas are about your career after your PhD.

All information will be processed confidentially and anonymously. You can withdraw from the research at any moment. There are no right or wrong answers, I would just like to know what your experience was.

Do you give your permission to record this interview? This will only be used to transcribe the interview, so that it can be analysed. After transcription, I will delete the recording of the interview and send you the transcript. Then you can let me know whether you agree with the transcript.

Do you have any questions right now?

Background questions

- Can you tell me something about your PhD?
- What was the topic of your research?
 - Did you do your research in a team or alone?
 - Was your research part of a project or did you come up with something by yourself?
- Did you finish your PhD trajectory yet?
 - If yes, when?
 - If no, how long will it take to finish?
- At which faculty did you follow your PhD?
- Internal/external PhD student?
- Why did you want to do a PhD?

PhD trajectory

- Can you tell me what a PhD entails? What is it that you are doing during this trajectory?
 - Are there other things that you do next to your research?
 - Is there a difference in what you are doing in the beginning, the middle and the end of your PhD trajectory?
 - To what extent are there different phases in the PhD trajectory? Or is it more a similar experience over the years?
 - Did you find your PhD more difficult in the beginning of the trajectory or more near the end?
- How did you experience your PhD trajectory?
 - What was hard and what went well?
- How did you experience your relationship with your supervisor? (daily supervisor/promotor)
 - What was nice and what was hard?
 - To what extent did you speak about your expectations towards each other?
- How did your thesis go?
- Did you teach as well? What did you think about that?
- Can you tell me something about your mental health during your PhD?
- Were there times that you wanted to quit your PhD trajectory?

- Can you tell me when in your PhD trajectory this was?
- Why did you want to quit then?

Psychological contract

Parzefall, M. R., & Jacqueline, A. M. (2011). Making sense of psychological contract breach. *Journal of Managerial Psychology*.

Can you describe an incident(s) when you thought your employer (or someone from the university) failed to fulfil an obligation towards you?

When did this happen?

- who have been involved in the incident? (supervisor, other students, teacher?)
- who did you hold responsible?
- why do you believe the incident happened?
- what happened prior to the incident? (What caused the incident?)
- how did you feel about it?
- What did it mean for you?
- how and why did you respond?
- what happened after the incident?
- Did this incident have influence on how you see the relationship with your employer?

Did more incidents happen where your employer didn't fulfil an obligation towards you?

Choice for an academic or a non-academic career

- What did you think about an academic career at the beginning of your PhD?
 - Did this change later on and why?
- What did you think about a non-academic career at the beginning of your PhD?
 - Did this change later on and why?
- Can you remember that you found or looked for help or information that changed how you thought about your career?
 - Where/from who did you get this information?
 - Can you indicate when in your PhD trajectory this happened?
- What was the moment you decided to continue or not in the academic world?
 - Why did you make that choice then?
 - Has this choice changed since then?
- To what extent did you feel prepared and informed about career options after your PhD?
 - To what extent do you think that you should be prepared and informed about an academic career?
 - To what extent do you think that you should be prepared and informed about a non-academic career?

Closing

- Do you want to add something or make something clearer?

- Informed consent
- Do you happen to know any other PhD candidates or alumni that would be willing to participate in this research?

Thank you for your time!

Appendix B

E-mail

Dear PhD candidate/alumnus,

My name is Shauni Achterstraat and I am following the master specialisation Strategic Human Resources Leadership (within Business administration) at Radboud University. Currently, I am writing my master thesis and I need your help to do it. My research focusses on how PhD candidates experience their PhD trajectory and which factors lead to the choice for an academic career or a career outside academia. In order to answer this question I am looking for respondents who I can interview about this topic. Are you near the end of your PhD trajectory or are you already finished? Then I would like to get in contact with you.

Please contact me via s.achterstraat@student.ru.nl or via 06-58913100.

Important information:

- The interview will be processed completely anonymously, meaning that what you say in the interview cannot be led back to you.
- The interview will be recorded, so that it can be transcribed. The recording will be deleted after transcription.
- You can withdraw at any given moment; beforehand, in the middle of the interview and afterwards.
- Because of the corona virus, interviews will be held online
- I am flexible and take your agenda into account
- The interviews will be held in Dutch and English (for non-Dutch speakers).

If there are any questions or uncertainties, please let me know.

I hope to hear from you!

Kind regards,
Shauni Achterstraat

Appendix C: Thematic Analysis

1. Description phases
 - a. First phase
 - b. Middle Phase
 - c. Last Phase
 - d. Other
2. Experience phases
 - a. First phase
 - b. Middle Phase
 - c. Last Phase
 - d. Other
3. Negative/difficult experience
 - a. Supervisor
 - b. Publishing
 - c. Planning
 - d. Motivation
 - e. Thesis
 - f. Support
4. Positive experience
 - a. Supervisor
 - b. Support
 - c. Social
 - d. Job content
 - e. Planning
 - f. Publishing
5. PhD position
6. Mental health
 - a. Agency
 - b. Stressors
 - c. Boosters
 - d. Internal/external PhD
7. Psychological contract
 - a. Career information/preparation
 - b. Breach
 - c. Reaction
8. Critique academic world

9. Career choice
 - a. Reasons to start a PhD
 - b. Change
 - c. Pro-academia
 - d. Non-academia
 - e. Other