OUT OF CONTROL: ORGANIZATIONAL DEFENSIVE ROUTINES

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A thesis submitted for the degree in partial fulfillment of the requirements for Doctor of Philosophy

July 2016

Bournemouth University

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Abstract

'Out of control: organizational defensive routines'

Yumei Yang

The current theory posits that organizational defensive routines (ODRs) are one of the reasons to explain why organizations still fail to achieve their learning goals. However, this assumption lacks consistent empirical evidence. This study is one of very few attempts to refine the concept of ODRs and analyze empirically the role ODRs play with respect to organizational learning.

The thesis is a collection of essays that addresses the challenges of understanding the effect of ODRs at organizational learning. Each essay has its own focused research objectives to respond the main research questions. The researcher first examines the characteristics of ODRs based on the concept of organizational routines, then the researcher addresses the theoretical debate of how ODRs can affect organizational learning. At organizations, not only organizational factors such as structure, size and age can affect organizational learning, but so does individual factors such as individuals' personality. Hence, the model integrated both organizational factors and individual factors into the model. To empirically assess the relationships proposed in the framework, it requires a reliable scale to measure ODRs which is missing in previous research. Therefore, the first study focuses on developing a measurement of ODRs through psychometric assessment and validation procedures. This study results in a construct measuring ODRs at the organizational level with two factors with eight items, namely *organizational cover-up* and *organizational pretense*. Additionally, ODRs at an individual level are measured by a scale with two factors and six items, namely *embarrassment avoidance* and *rigidity at work*.

Equipped with the newly developed measurement of ODRs, the researcher conducted another two studies to test theoretical relations between ODRs and organizational learning. The second study uses multiple regressions to analyze the sample of 358 working on organizations of various size, structure, and age. The study includes some important predictors such as age, size and structure of organizations. The researcher confirms that centralized and formalized structures are negatively associated with organizational learning, but age and size do not have statistical influence on learning. The researcher confirms that high ODRs worsen the negative relationship between formalization and organizational learning.

The third study applies the ODRs scale at the individual level to test role of these routines on organizational learning. It employs multiple regressions to analyze a sample of 351 observations. All the participants have more than one year working experience in their current organizations. The study includes three important personality traits as predictors, namely conscientiousness, openness to experience and neuroticism. The researcher confirms that openness to experience and neuroticism affect organizational learning. However, the researcher fails to find support on the theoretical hypotheses which predict the level of ODRs has an effect on relationships between organizational learning and those three traits.

Theoretically, this study clarifies the definition of ODRs and built a close link with the organizational routines. It also enriches current understanding on the characteristic of routines being stable at the lens of defensive routines. The newly developed scale provides an opportunity to empirically test their roles on

organizational learning and other organizational variables. While findings of the empirical study targeting the organizational level lead to the conclusion that organizations should endeavor to reduce ODRs, findings of the other empirical study suggest that individual's perception of ODRs could be beneficial for organizational learning. This work claims that there seem to be a collective/social effect that is not apparent at the individual level while it influences the organization. Results diverging from theoretical deductions stimulate interesting prospects for further research in the future which are also discussed. Finally, the study indicates that structure is the most effective factor of organizational learning in comparison with age and size. Hence, organizations should endeavor to reduce the level of formalization and centralization to create a learning environment.

The study can benefits organizations at following three aspects. First, organizations can make use of the new scale to identify ODRs at any stages of their development. This would prevent organizations from suffering serious consequences of by-passing and covering up negative issues caused by ODRs. Second, the organizations regardless of age and size can learnt from this study about the importance to realize the contributions of ODRs at organizational level and individual level. In order to alleviate ODRs, organizations should consider changing organizational factors which encourage people at organizations collectively avoid open communication. Meanwhile, they also need to pay attention at educating individuals who tend to be more likely to avoid discussing embarrassing issues. Third, organizations should design an appropriate organizational structure to facilitate information sharing and empower employees at decision making.

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Acknowledgements

The completion of this journey would not have been possible if I did not get the support of many individuals. It is impossible to list all of them within these few pages. Hence, I would like to highlight some of them whose constant encouragement and support accompanied me through this long journey.

I would like to express my special appreciation and thanks to my two supervisors, Dr. Davide Secchi and Dr. Fabian Homberg, you both have been tremendous mentors for me. I would like to thank you for encouraging me to overcome all the hurdles in my Ph.D., and allowing me to grow as a research. Your advice on the research and career will be always cherished. Over the years of working together, I learnt form you being rigorous and innovative at researching. I also would like to show my appreciation to Dr. Jens Mohrenweiser who patiently gave me advise on data analysis. My appreciation also goes to Dr. Gbolahan Gbadamosi who gave me valuable suggestions on measurement development.

For family, first and foremost, I am most grateful to my husband, Andy, who has always been there for me when I was frustrated and stressed. He schedules his work around mine so that I could focus on my research and attend workshops. He was like a pillar of the family. Without him, I would not be able to devote myself to the research while raising up our energetic little boy. So thank you for your support. I also would like to thank Barras Stone who has been like a father to me. His wisdom to life and to academic research guided me to battle through this challenging journey. I could not miss to thank my lovely three-year old son, Jason, whose birth has been a great gift to my life. Every time when I have a moment of thinking about giving up

the research, it was his little cherub face to cheer me up and brighten up my life. It is such a blessing to have you in my life. I would also like to dedicate this thesis to my late parents who taught me to be resilient and diligent in order to achieve my life goal. Without these characteristics, my journey to Ph.D. could not be fruitful. My sister, Jinmei Yang, has always cared about me like her own child. She shows concern about my progress and well-being every week via numerous long international phone calls. A special thanks also goes to my in-laws who have helped me look after my little boy so that I can spend more time on research.

Last, but not least, I would also like to show my gratitude to my friends and colleagues who have been encouraging me to compete my Ph.D.

Declaration of Co-authorship

I hereby declare that this thesis incorporates material that is result of joint research, as follows:

This thesis incorporates guidance from Dr. Davide Secchi and Dr. Fabian Homberg, the authors' supervisors. The collaboration with both supervisors including guidance on the literature review and techniques on data analysis. In general, they perform as a sounding board. In all cases, the key ideas, empirical designs, data analysis and interpretation were all carried out by the author.

I am aware of the Bournemouth University Policy on Authorship and I certify that I have properly acknowledged the contribution of other researchers to my thesis.

I certify that the research is the product of my own work.

CHAPTER ONE: Introduction and Rational

In the 1970s, Ford produced Ford Pinto cars with a faulty design. The cars leaked oil at low speeds of 20mph resulting in fatal accidents. Staff were aware that the speed did not meet the Federal requirement of 30mph, but they feared proposing a different opinion to managers would put their job in danger (case summarized from Boddy and Paton 2011).

In 1986, the Challenger space shuttle exploded after 73 seconds of launch. All the astronauts onboard died. Though the managers had knowledge of the "O" ring inadequacies, their "can do" attitude and avoidance at asking hard questions prevented the commission from identifying errors and avoiding the catastrophe (case summarized from Moorhead, Ference and Neck, 1991).

1.1 Problem Statement

Human beings are social animals. At an early age, people learn social virtues in order to be accepted by society, such as respect for others, suppressing their own negative feelings and trying to avoid embarrassing other people in public. Those social virtues are assimilated into organizational life and affect people's behavior when dealing with issues that are complex, embarrassing, or threatening, especially when organizations have a culture not to encourage people to show different opinions to authorities. When a negative issue is communicated, people tend to make their fellow colleagues realize the mistakes and, at the same time, they try to communicate the negative message without upsetting anyone. Therefore, messages are often crafted ambiguously and inconsistently. On the one hand, this inconsistent behavior protects people from experiencing pain; on the other hand, it keeps people

from learning the core reasons of causing the pain. People often employ this covert behavior in the name of caring and diplomacy. Nevertheless, the unintended consequences of this behavior have adverse effects organizational values, goals and productivity (Sales et al. 2013). Based on Argyris' consultancy experience, he generalized that "any actions and policies that organizations or segments used to avoid embarrassment and threat are organizational defensive routines" (hereafter ODRs) (Arygirs, 1990, p.25). Argyris' seminal work on defensive routines revealed how individuals' good intention to avoid embarrassment results in a negative impact on organizational effectiveness. He concluded "By adeptly avoiding conflict with co-workers, some executives eventually wreak organizational havoc." (Argyris, 1986, p. 74). ODRs are thought to be a crippling source of malaise and a barrier to organizational learning.   They can damage organizations in the long term and cause disastrous results. Ford Pinto cars and the Challenger space shuttle are examples showing colossal damage of ODRs to organizations

ODRs occur regularly in organizations of any size. The following two examples illustrate how ODRs are elicited and what damages these routines can cause to organizations. First, Xerox is a known company that suffered from ODRs. In 2014 the Xerox executive team met to discuss the sale of its information-technology-outsourcing (ITO) business to a French company. At meetings everyone expressed that it was a right decision. However, disagreement was only discussed secretly in private meetings. People in the organizations were disingenuously polite and tended not to be forthcoming about their feelings. This is typical organizational defensiveness at play. The reason why people do not show their disagreement openly at a meeting is because they want to avoid embarrassment to themselves and

to others. However, this avoidance behavior makes the meetings meaningless. Those private meetings only create an air of secrecy and restraint among teams (Tech Inside, 2016).

The second example is about an anonymous institution[1]. The institution initiated a consultation to discuss whether it was right to downgrade some administrators. The meeting assessed administrators' workload, and the result was to be announced at a due date. However, the administrators already knew the decision before the meeting, because one email from a decision maker was mistakenly sent to one of administrators. This email stated who was going to be downgraded before the consultation. Administrators were furious by this dishonest behavior, but nobody revealed their genuine feeling at the meeting. Everyone went along with the meeting and pretended everything was perfect. This looks like an extreme example of ODRs, but it may happen frequently in organizations. Meetings are not for discussing different perspectives toward organizational issues, but they are masked as a strategy for management to demonstrate their leadership skills by deceivingly involving employees into decision making. Employees' voices do not have much effect on final decisions. That is why quite often meetings become meaningless.

Organizational defensive routines handicap employees from reflecting on their own contribution to cause counterproductive effects on organizational learning. They tend to be automatic and mindless so that people who perform ODRs do not realize that their good intention of being "kind" actually becomes a hurdle for other people. This hurdle discards open discussions related to negative organizational issues.

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[1] This is based on a real event. The organization's name is not revealed due to confidentiality.

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Without realizing errors in their behavior, problems will continue to lay underground in organizations. Consequently, only easy solutions are made toward improving existing behavior, but radical changes for solving important issues are avoided (Argyris, 1990, 1993; Noonan, 2007) inhibiting organizational learning.

Through organizational learning organizations are able to improve competitiveness (e.g. Cohen & Levinthal, 1990; Levitt & March, 1988). In order to learn, organizations need to identify errors in current individual and organizational routines and have an environment to share information (Argyris, 2001; Huber, 1990). While ODRs exist, people suppress certain uncomfortable issues related to conflict and embarrassment. Accordingly, the issues are buried deeply and day-to-day operational activities take priority. Hence, on the surface such organizations seem to be flawless. This deceiving image of organizations prevents people from exploring issues present in the organization which are uncomfortable to reveal but are crucial for organizational performance.

The impact of this negative routine behavior on the organizational learning abilities illustrates that it is still instrumental for academics and practitioners to understand ODRs. Nevertheless, current knowledge about ODRs still remains at a stage similar to what Argyris proposed in 1970s. There is very limited empirical research carried out to verify the theoretical inferences of ODRs. The theoretical assumption that ODRs are barrier to organizational learning is well accepted by academics, even though only limited empirical studies have been carried out to test this assumption (e.g. Chouikha, 2016; Easterby-Smith, Snell & Gherardi, 1998; Hernes & Irgens, 2012). Thus, the current situation creates major challenges for understanding the

impact of ODRs in organizational life. The reasons why ODRs are not explored much at the current literature can be explained from two facets. The first facet is from a methodological perspective. The current literature on ODRs is mainly based on consultants' case studies. These methods provide detailed explanation of the types of ODRs and the damages of ODRs based on specific organizational cases. However, they do not provide a systematic and consistent understanding at the role of ODRs. The lack of a scale measuring ODRs creates a challenge for researchers to explore ODRs and generalize their effect on organizational practices. Because of this methodological restriction, researchers often resort to two other related concepts of ODRs, red tape and organizational silence to explain reasons why people suppress their opinions and avoiding potential negative consequences (Bozeman & Feeney 2011; Morrison and Milliken 2000; Brinsfield, 2013). However, these two concepts are different from ODRs empirically (see Chapter 4). The other reason is at theoretical perspective. ODRs are defined as a subset of organizational routines according to Argyris (1990), yet Argyris did not provide much explanation on how these two concepts are related to and distinguish from each other. For example, how the characteristics of organizational routines being a repetitive, recurrent and collective behaviour can be related to ODRs. Additionally, it is still contentious to perceive routines being inertia or/and a source of change. The recent understanding of routines being a source of both change and stability also has not been applied to understand ODRs. Hence, lack of clarification on the relation between organizational routines and ODRs also prevent research on investigating the role of ODRs.

First, it prevents the generation of knowledge on the nomological network of ODRs. Second, one driver of this situation might be the lack of a measurement scale. In

order to address these two shortcomings, the aims of this thesis are (i) to develop and validate an ODRs scale; (ii) to start building empirical evidence on the effect of ODRs with respect to the relations between organizational and individual factors and organizational learning.

1.2 Purpose of the Study

The few existing studies on ODRs are based on qualitative information provided by Argyris and others who theoretically proposed that ODRs might negatively affect organizational learning regardless the organizational characteristics (size, age, structure and people). However, there are questions that are not answered in the current studies of ODRs.

(1) How can ODRs be empirically measured at both organizational and individual levels?

(2) Do ODRs have negative effects on organizational learning empirically?

(3) Do different levels of ODRs affect organizational learning differently when organizational factors (size, age and structure) are considered?

(4) Do different levels of ODRs affect organizational learning differently when individuals' personality is considered?

These four unanswered questions in the literature serve as research questions of this study. They also indicate the primary purpose of this study, which is to empirically study the role of ODRs with respect to organizational learning, through developing a scale for ODRs and constructing extended models which test the theory.

In order to carry out empirical research, the study first requires developing a scale to measure ODRs. The scale development study follows the processes suggested by

(DeVellis, 2012; Hinkin, 1998). The second question is to test the theoretically assumed relationship between ODRs and organizational learning. The third and fourth questions are to find whether ODRs moderate the relationship between organizational factors and organizational learning; and the relationship between individual factors and organizational learning. The theoretical models are developed based on these questions. The first question is the ultimate objective for the study in order to proceed further to answer the other three questions.

Based on these four research questions, the following research objectives are outlined:

1) to develop a measurement for ODRs;

2) to assess the relationship between ODRs and organizational learning;

3) to estimate whether ODRs moderate the relationship between organizational factors and organizational learning;

4) to assess whether ODRs moderate the relationship between individual factors and organizational learning.

1.3 Significance of the Study

The study is significant to academics, practitioners and organizations trying to understand the mechanisms contributing to organizational learning. The significance of the study is addressed in terms of its theoretical and practical contributions.

1.3.1 Theoretical Contribution

The study makes two theoretical contributions: First, the concept of ODRs is

extended and its relationship as a moderator to organizational learning is explored. Based on the existing theory of ODRs, this study develops a scale to measure ODRs at an organizational level and an individual level via six sequences of studies and three groups of samples. The theoretical models developed for constructing the components of the scale systematically generalized the characteristics of ODRs. The newly developed scale provides a tool for academics to empirically test the effect of ODRs on individuals and organizations.

Two empirical studies implement the scale of ODRs to gain empirical evidence on the relationship between ODRs and organizational learning in consideration of other organizational and individual factors. The findings of the studies empirically assess the effect of different levels of ODRs on organizational learning. This builds empirical knowledge which is able to identify and help explain what the effects of ODRs are in reality. Thus, it constitutes to the knowledge on the negative effect of ODRs on organizational learning- a theoretical argument frequently found in the literature.

Second, the study contributes towards the literature of organizational learning. It tests the impact of organizational factors and individual factors on organizational learning. The finding broadens the knowledge on the antecedents of organizational learning and initiates more academic interest to explore other factors contributing to organizations' learning ability.

1.3.2 Practical Contribution of the Study to organizational defensive routines

Organizational defensive routines exist in most organizations regardless of their age and size (Argyris, 1990). Organizational defensive routines are prevalent and intangible most times. Hence, it is challenging for organizations to identify this destructive behavior. Having an instrument to measure ODRs helps organizations to recognize their weakness in covering up core issues, especially at the time when candor opinions are most needed for generating changes and improving organizational performance. Organizations also could benefit from applying the scale to staff training. Making the constituents of ODRs explicit can evoke employees' consciousness on their contribution to these negative practices in organizations. Hence, employees can identify these automatic and mindless activities by referencing the items against their own behavior towards handling uncomfortable issues. Furthermore, another potential benefit of the scale is to advance organizational development via identifying and attenuating the defensive organizational culture. As organizations with ODRs often restrict themselves to the short-term solutions towards existing problems, this only produces incremental changes. Long-term organizational development requires a context which encourages employees to discuss the underground issues.

The findings of the empirical studies have practical implications for managers. If the study finds ODRs mitigate the effect of individual and organizational characteristics on organizational learning in a negative way, this is consistent with theoretical assumptions made in existing literature. It will be rational for organizations to reduce or eliminate ODRs regardless of their resources and labor force. Additionally, evaluating the relationship between organizational factors and organizational learning could assist organizations in designing their structures for facilitating their

learning abilities. Furthermore, the findings of the study on the relationship between individual factors and organizational learning could give guidance to organizations for composing teams and recruitment.

1.4 Snapshots of the thesis

The thesis is composed of eight chapters. The following paragraphs briefly summarize each of them. Chapter 2 reviews the current literature on organizational routines, organizational learning, organizational factors (size, structure and age) and individual personality traits (conscientiousness, neuroticism and openness to experience) and organizational defensive routines. A theoretical model emerges from existing literature suggesting that ODRs are a moderator of the relationship between organizational factors and organizational learning; and the relationship between individual factors and organizational learning.

Drawing on the understanding of organizational routines and linking them with the characteristics of ODRs, the study concludes that ODRs share the characteristic of being a source of stability instead of change. Due to this inert and covert nature, organizations with well selected people and appropriate resources still often failed to achieve their learning goals. Hence, the study suggests that it is ODRs that partially explain why an inferior learning outcome happens. However, based on the researcher's knowledge, the literature fails to provide a reliable scale to measure ODRs. Hence, developing a measurement for ODRs becomes an inevitable step before testing this model.

Chapter 3 explains the choice of philosophical paradigm and research design. After comparing three research paradigms which are often used in social science, this study adopts post-positivism. The study employs quantitative method via data collection and data analysis to test hypotheses. The study applies test-retest measures for variables of the framework except ODRs.

Chapter 4 develops a scale to measure ODRs. Best practice recommendations of scale development require a sequence of six studies to be carried out. The first step involves the process of reviewing research about ODRs in order to identify components of ODRs. From the theoretical review, it is concluded that ODRs have two levels: organizational level and individual level (see Chapter 2). Then based on the well archived existing qualitative research, an item pool is created. People from both academia and the industry were invited to comment on the items. Refined items are then combined into a survey. Exploratory factor analysis (EFA) results in two factors to measure ODRs at the organizational level. The researcher generalized the common theme of items and named the factors *organizational cover up* and *organizational pretense*. EFA also results in a two second-order factors to measure ODRs at an individual level, which are named *embarrassment avoidance* and *rigidity at work*. Following the EFA, another different group of sample is applied for confirmatory factor analysis (CFA) which further tests the model suggested by EFA. The findings of CFA show a good model fit for both constructs. To compare ODRs with their similar constructs, the researcher combined the survey with another project to collect an additional sample for assessing convergent and discriminant validity. Results from the analysis show that ODRs at organizational level are similar to the concepts of organizational silence and red tape, but empirically different. They also

show that ODRs at individual level are similar to defensive silence and employee silence behavior, but again empirically different. This supports the convergent and discriminant validity of the scales. The researcher also established predictive validity by showing that ODRs can negatively and significantly predict psychological safety at an organizational level; and it can negatively and significantly predict job satisfaction. As the final step of measurement development, the researcher established measurement invariance with the assistance of multi-group CFA which compares the construct with samples from the UK and US. This series of studies followed best practice recommended for scale development (DeVellis, 2012; Hinkin, 1998). The scales meet all reliability and validity criteria and thus can now be tested in empirical settings.

Chapter 5 empirically assesses how ODRs affect the relationship between organizational factors (size, structure and age) and organizational learning using the newly developed scale from Chapter 4. This allows the researcher to empirically test the model introduced in Chapter 2. Chapter 5 tests half of the model which is about the relationships between organizational variables (size, age, structure and ODRs) and organizational learning. Theoretically the relationship between organizational factors (size, age and structure) and organizational learning are established again based on the argument presented in Chapter 2 and additional literature. The analysis is undertaken using a sample of 440 observations. The result shows that ODRs moderate the relationship between formalization and organizational learning. That means ODRs worsen the negative relationship between formalization and organizational learning. The result also confirms the theoretical suggestion that ODRs are counterproductive to organizational learning.

Chapter 6 empirically tests the remaining part of the model which assumes ODRs moderate the relationship between individuals' personalities (conscientiousness, openness to experience and neuroticism) and organizational learning. The researcher used the same sample from Chapter 5. The findings of the analysis indicate that ODRs do not moderate any of the relationships proposed theoretically. It also counterintuitively shows that ODRs at an individual level are positively related to organizational learning.

Chapter 7 provides a general discussion on the findings of all the studies in the thesis. It also proposes the implication of the studies towards academics and industries. Chapter 8, the final chapter, concludes the thesis with limitations and recommendations for future studies.

The researcher would like to give three reasons why the thesis constructs propositions in Chapter 2, then converts propositions into hypotheses in Chapter 5 and Chapter 6. First, there is lack of systematic understanding on the components of ODRs, which only allows the researcher to conceptually propose the relationships between variables based on the existing research. However, after a robust process of scale development for ODRs presented in Chapter 4, the researcher is able to refine those propositions and deduce hypotheses for empirical tests on these variables. Second, operationalization of concepts for testing hypotheses requires different arguments in comparison of constructing theoretical propositions. Third, this thesis estimates some very complex organizational concepts such as organizational learning, and organizational defensive routines. Researchers view these two concepts

from different disciplines and levels (e.g. Easterby-Smith, et al., 1998; Rerup and Feldman, 2011; Cohen, 2012). These different arguments are all beneficial for this study, but will make the literature review very cumbersome. Therefore, the researcher has allocated the information into multiple chapters serving the respective chapters' need. This way of structuring the thesis not only makes the arguments in each chapter concise, but also enhance the readability for Chapter 5 and Chapter 6 which can be considered as two complete empirical studies.

1.5 Summary

A brief explanation of the study of ODRs reveals a gap in the literature that there is a need to empirically test the theoretical assumptions postulated by Argyris. The assumption is that ODRs are one of the reasons to explain why organizations with adequate resources still fail to reach their learning goals. This theoretical assumption is well recognized and accepted by academics and practitioners, but there is a lack of empirical support to this assumption. This highlights a need for empirical studies to test this assumption.

Based on the literature gap, four research questions are proposed to guide the directions of the study. Four objectives are identified in order to answer the questions.

This chapter also explained the significance of this study towards academics and industries. In general, this study attempts to develop a scale to measure ODRs. The scale will contribute towards further development of frameworks for understanding ODRs empirically. This study also provides empirical evidence as to the negative

effect of ODRs on the organizational learning proposed by Argyris. Furthermore, this study provides information that organizations with desire for increasing their learning capacity which should not only pay attention to organizational design and personnel selection, but also a need to reduce ODRs. Finally, the chapter briefly summarized each individual chapter, which indicates the structure of the thesis.

CHAPTER TWO: Literature Review and Theoretical Framework[2]

2.1 Introduction

The previous chapter provided an outline of the whole study. This chapter now reviews the literature related to organizational learning, ODRs, and organizational routines. It also forms propositions based on the theoretical deductions on relationships between concepts, namely, ODRs, organizational learning, personality traits and organizational factors (size, age and structure). The framework designed in this Chapter serves as a foundation for the whole thesis. The propositions introduced here are then refined and converted into hypotheses in Chapter 5 and Chapter 6 after the scale of measuring ODRs is developed in Chapter 4.

2.2 Organizational Learning

ODRs could have an effect on other organizational factors, but so far they have been closely linked to organizational learning. This close link between these two concepts mainly relies on the studies from Argyris and Schön (1978) and Argyris (2001). Therefore, as a stepping stone before proceeding to empirically analyze the interplay of ODRs with other organizational factors, this section focuses on assessing the currently well-accepted theoretical inference on the negative effect of ODRs on organizational learning. In order to understand the theoretical relationship, it is essential to clarify (1) the nature of organizational learning, (2) to discuss its

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[2]. A paper based on this Chapter has been presented at the British Academy of Management 2014 annual conference.

emergence, (3) to define different levels of organizational learning and (4) to identify impediments to organizational learning.

2.2.1 The meaning of organizational learning

Though the concept of organizational learning has been in existence for over 50 years (March 1958), there is no unanimous definition for organizational learning (Easterby-Smith et al., 1998; Popova-Nowak and Cseh, 2015). Researchers from different fields tried to define learning on their own philosophical stances (details see Popova-Nowak & Cseh, 2015). The functionalist paradigm is a dominant way of understanding organizational learning and it considers individuals as key agents in collecting, interpreting, disseminating, storing, and retrieving information within organizations, and this learning process interacts with the organizational structure which provides reference for individual's cognition and behavior (Popova-Nowak & Cseh, 2015). Argyris & Schön (1978) define organizational learning as a process of detecting and correcting error. In respect of this concept of learning, if errors are discovered, learning will not occur. Fiol and Lyles (1985) consider learning as a process of improving actions through better knowledge and understanding. To Levitt and March (1988), learning is about encoding past experience into routine behavior. It is a process of developing new knowledge through which potentially changes behavior (Huber, 1991). Despite the diverse views on learning, researchers often assume organizational learning as a "linear process that is the same across all levels of analysis" (Popova-Nowak & Cseh, 2015, p. 305).

2.2.2 How organizational learning takes place via three perspectives

Learning in organizations has been studied from various perspectives based on different disciplines (cf. Antonacopoulou and Chiva, 2007; Easterby-Smith et al., 1998). The focus of this study is not to discuss the differences of perspectives, but to study factors influencing organizational learning. Here the researcher briefly reviews organizational learning based on an individual learning theory and a social learning theory. Individual learning theories are traditionally adopted to explain how individuals act on the behalf of organizations to process information and make decisions (March and Olsen, 1975). Individuals hold mental models in their minds which stores information to guide actions (Senge, 1991). Learning causes changes of individual mental models, and these changes affect organizational learning through their influence on organizations' shared mental models (Kim, 1993). Proponents of this view suggest that organizations learn through individuals who acquire knowledge, distribute knowledge, interpret and integrate to organizational routines codified as rules or procedures (Cohen and Bacdayan, 1994; Hayes and Allinson, 1998; Huber, 1991). However, it needs to be clear that organizational learning is more than the cumulative sum of each member's learning. Organizational learning does not only influence each current member, but also future members who learn from the experiences of others via organizational memories such as norms, histories and routines. Therefore, Daft and Weick (1984) suggested that organizations are considered to have their own cognitive systems and memories. Organizations store the knowledge and accumulate over time from their members in a form of rules and procedures, and individual organizational members associate with those beliefs. Over time, both mutually affect and modify each other (March, 1991). It is important to

be aware of that it is incorrect to equal organizational learning to individual learning, yet individual learning has been considered as an essential part of organizational learning process (e.g. Huber 1991; Crossan et al, 2011; Friedman 2002; Kim 1993). Huber (1991) contends that organizational learning goes through four processes. The first two process, knowledge acquisition, information distribution are carried out by individuals. Crossan et al. (2011) though had a different view from Huber, he also agreed that organizational learning first starts from individuals. Hence, learning should not be simply equal to organizational learning, but should presume that better individual learners might contribute more to organizational learning.

The other perspective is the social learning view which implies that individuals are social actors who learn from social interactions within a social system such as organizational context (e.g. Antonacopoulou and Chiva, 2007; Easterby-Smith, Snell and Gherardi, 1998). This view emphasizes learning in a group and organization through participation and interaction, rather than the mind of individuals (Elkjaer, 2003). An individual is a social being who constructs learning in a social-culture setting which impacts learning in return. Hence, learning and social context are not independent from each other. Instead, they mutually influence each other. The social view on organizational learning treats organizations as social worlds whose members' knowledge acquisition is not merely for work, but for social identities (Gherardi et al., 1998). In order to integrate into society, individuals have to learn in order to engage with others in a continuous practice. During the learning process, it is inevitable to cause conflict when old knowledge or experience is demolished and established social relations are disturbed (Elkjaer, 2004). Additionally, organizations are social systems in which emotions and intuition can play an important role in

learning. If those emotions are not dealt with appropriately, it could make individuals in organizations be defensive towards negative performance. Hence, it is important to have a proper organizational context to appreciate the benefit of conflict and resolve the conflict with open discussion. This view directed the locus of information process to the participation of individuals in an organizational context which learning takes place. In this perspective, language becomes a central element of learning as it is a medium of knowledge transmission and culture (Gherardi et al., 1998). Furthermore, this perspective of viewing learning as a social activity naturally puts learning as a mutual formation of individuals and organizations. This shows that organizational learning could be affected by both factors accordingly.

Another view of understanding organizational learning is from a perspective of general routines. Levitt and March (1998, p. 320) defined organizational learning as "a process of encoding inferences from history into routines that guide behavior". On the one hand, individuals in organizations learn most of their work-related performance via stored organizations' memory—organizational routines and procedures. On the other hand, organizational learning is like a synergy of individual memories. It stores individual knowledge and hands it down to the new members (Cohen and Bacdayan, 1994; Becker, et al., 2005). Tranfield et al. (2000) viewed organizational learning as just routines although from another perspective. They categorized routines into two types: enabling routines and defensive routines. These two types of routines are in a state of quasi-equilibrium towards organizational learning; organizations only learn when enablers' driving forces are stronger than defensive routines.

2.2.3 Levels of Organizational learning

Argyris and Schön (1978) separated the broad field of organizational learning into single-loop and double-loop learning. Single loop learning involves detection and correction on the mismatch between expectation and outcomes. This learning does not change the governing policies and values. In contrast, double loop learning involves re-examination and change of governing policies and values. Therefore, "Single-loop learning is usually related to the routine, immediate task. Double-loop learning is related to the non-routine, the long-range outcome" (Argyris, 1993,p.116).

From a cognitive perspective, single loop learning is characterized by low levels of learning and corrective learning (Fiol and Lyles, 1985) and exploitative learning (March, 1991; Lavie et al., 2010). It changes people's behavior, but does not change cognitive processes stimulating that behavior. Therefore, the change is temporary and only produces a "bandage effect" as a means-end solution to organizational problems. Single-loop learning only creates incremental change on existing organizational routines. It hides and by-passes the fundamental causes of organizational problems and leads to the obsolescence of capabilities on adapting changes (Farjoun, 2010). Most learning in organizations is single-loop learning or incremental learning (Fiol & Lyles, 1985; Miner & Mezias, 1996). From the organizational perspective, this kind of learning costs less by adjusting well-practiced routines rather than conducting transformative changes on routines. For employees, most people are comfortable with what they know. Hence, it is easier for employees to accept minor modifications of their behavior than to carry out a

dramatic change on their daily routines.   Therefore, single-loop learning takes up the majority of organizational learning.

In contrast, double-loop learning is characterized by high levels of learning or generative learning (Lopez, 2006). It is a cognitive process which involves people reflecting on the differences between what they think and what they really do in practice. By reflection, people change their actions to be more congruent with the values they perceive as appropriate. Normally it produces a new understanding of situations and leads to change the fundamental way of doing things. This kind of learning is considered a high level of learning; it causes radical forms of learning and genuine learning (Mazutis et al., 2008). For example, double-loop learning aims to change overall organizational norms rather than refine specific organizational actions (Henderson et al., 2013).

The theory of single and double loop learning has been challenged by some scholars (Miner & Mezias, 1996; Lipshitz, 2000; Miner et al., 2008), because Argyris' early work described single-loop learning and double-loop learning as a dichotomy: one is extremely good and the other is extremely bad for organizations to solve difficult problems (Miner & Mezias, 1996). However, Gupta, Smith and Shalley (2006) proposed that organizations should achieve a balance between both types of learning. Organizations need single-loop learning to increase production efficiency via adjustment of existing routines. However, single-loop learning should not be the major strategy for organizations to deal with problems, as single-loop learning can camouflage organizational issues with short-term solutions resulting in doing the wrong things rightly (Greenwood & Jennifer, 1998).   Single-loop learning or

exploitative learning is more suitable for organizations in the context of being stable and safe, and double-loop learning operates more effectively when organizations are going through changes and complex situations (Kim, Song and Kerkar, 2012). Therefore, both types of learning are required for organizations in accordance with their situational needs. Argyris (1996, p.80) even concludes "while technical theories were implemented correctly, single-loop learning can be liberating alternatives."

2.3 Organizational Routines

Studying general organizational routines could improve understanding of ODRs. Different from the limited studies on ODRs, academics have paid substantial attention to the understanding organizational routines. They have attracted continuous interest from researchers with respect to various issues such as change, learning or organizational actions (e.g.Becker & Zirpoli, 2008; Nelson & Winter, 1982; Pentland, et al., 2010). The current debate on routines is mainly about whether routines are inflexible and mindless, or they are a resource of both change and stable. The more traditional approach of routines is explained by three famous metaphors, individual habit, programs and genes. However, contemporary literature on organizational routines tend to consider routines being stability and change (Feldman & Pentland, 2003; Gilbert, 2005; Rerup et al., 2011).

2.3.1 Organizational routines and stability

The traditional view treated organizational routines as (a) individual habit, (b) performance programs, and (c) employed the metaphor of "genes." According to the first perspective, routines are like individual habits in that they become reflex and automatic actions (e.g. Becker and Zirpoli, 2008). Also routines operate via individual habitual behavior that mainly is non-deliberative and non-intentional (Hodgson, 2008). However, habits are different from routines. Habits are often referred as individual-level dispositions to engage in a particular behavior in response to stable contextual cues (Knudsen, 2008). From a view of pragmatist philosophy and instinct psychology, Hodgson and Knudsen (2004) posited that habit is propensity to react to certain stimuli and social institutions help to reinforce habits. Routines are meta-habits, existing on one ontological layer above habits themselves (Hodgson and Knudsen 2004, p. 289). Organizations provide social and physical environment to guide individuals' habitual behavior. In the second perspective, routines have been equated to performance programs that are institutionalized rules or standard procedures from previous successful experiences (Cyert and March, 1963; Levitt, et al., 1999). They require more adjustment than habits because they involve compromises from each member's habit to suit organizational development. However, they do not require deliberate consideration as most decisions are made in advance (Feldman and Pentland, 2003). The third theoretical perspective relates routines to biological "genes" (Nelson and Winter, 1982). Employees in organizations change over time, but some information is stored and carried forward, like genes inherited by the new employees. Routines here are like the memory of the organization. The gene analogy highlights that organizational routines have an important function as a capability reservoir for organizations (Hodgson, 2008). This

prevailing understanding of routines being like 'genes' is from an evolutionary theory which borrowed biology. Some routines persistently passed down after the process of variation, selection and information transfer (Knudsen). It emphasizes the characteristics of routines being repetitive, recurrent and automatic.

These three popular metaphors of organizational routines reflect a common feature: stability. In this perspective routines are mundane, mindless and lack deliberation (Becker, et al., 2005). Nelson (1991) also described routines as a partially automatic collective performance that is embedded in organizational capabilities in the form of implicit knowledge. This implicit knowledge such as abstract and generalized rules is labelled as the *ostensive* aspect of routines by Feldman and Pentland (2008). Feldman and Pentland (2003) criticized the traditional views on routines as an incomplete perspective without consideration of employees participating in the routines. However, the traditional view overlooks that employees are the agents of routines and they can deliberately adjust routines or modify them in coordination with other individuals to suit different situations. Therefore, Feldman and Pentland (2003) suggested that routines have a *performative* aspect, too. This means modification on routines can emerge from employees' performance on routines. The ostensive and performative aspects of routines are interdependent, and thus can sometimes act in a complementary and sometimes in a contradictory fashion.

2.3.2 Organizational routines and change

A more current view not only recognizes routines as being stable, but also points out that organizational routines are effortful accomplishments of employees who mindfully select action at specific time and specific situation (Feldman 2000).

Recently organizational studies published a special issue on routine dynamics. Mainly these research challenges the conventional understanding on routines being inertial. For example, using simulation techniques, Yi et al. found that 'a reduced rate of change at the routine level may cause variations in the pace and sequence with which planned changes to the routines and their effects take place, and such reordering of the planned changes may open the door to further organizational exploration and adaptation' (2016, p. 796). In other words, the current research on routines advocate that routines are a source of stability and change (Feldman and Pentland, 2003). Farjoun (2010) noted that they are interdependent and influence each other. This is because the stability side of routines or the ostensive factor of routines gives directions or guidelines to employees, but the agency of actors who perform routines in organizations intentionally or unintentionally tailor routines based on the situations (Howard-Grenville, 2005). Employees' reflective talk on the established behavior could elicit a new way of acting (Dittrich, Guerard and Seidl, 2016). Consequently, these patterns change in the organizational context and/or their own performance. Feldman and Pentland (2003) generalized these two characteristics of routines and defined routines as "a repetitive, recognizable pattern of interdependent actions, involving multiple actors, but they cannot be understood as static unchanging objects" (p.95).

In this definition "A repetitive, recognizable pattern" echoes the traditional view on organizational routines being stable; but "multiple actors" emphasizes the roles of employees as the agent carrying out the routines. This is because individuals interpret and conduct routines differently in accordance to either their own experience or a particular situation requirement, despite the fact that written routines

are invariable. For example, Howard-Grenville (2005) observed employees' behavior in a high-tech manufacturing company and found that employees interpret routines differently depending on time and situation. Overall it is worthwhile noting that routines do not only present themselves in archived rules, schedules, and standard operating procedures, but also develop through interaction and cooperation among actors (Turner and Rindova, 2012). The literature on routines also posited that collective reflect communication at the situating problems is an important factor of contributing to changes at current routines (e.g. Dittrich et.al. 2016; Howard-Grenville, 2005). Hence, routines are not static, but can be modified during the process of performing them. Some of the variations can be institutionalized and become part of legitimate routines; some others may not be incorporated.

It is important to recognize the role agents at organizational routines. However, the role of institutions should be acknowledged as well. Based on DiMaggio and Powell's work, organizations change routines can be categorized into three mechanisms, namely coercive isomorphism which stems from political influence; mimetic isomorphism resulting from standard responses to uncertainty and normatice isomorphism associated with professionalization (1983, p. 150). These three mechanisms indicate whether stabilizing or changing the current routines is not only a choice of individuals; but also a force of different institutions. These institutions could be government bodies, competitors or professional associations.

2.4 Organizational Defensive Routines

As a subset of organizational routines, ODRs share the characteristic of being stable. Employees who produce ODRs are not aware of their counterproductive actions. They carry out these defensive actions automatically by following organizational

norms or protecting themselves. Such ODRs recur mindlessly and unreflectively. In this sense ODRs share the feature of having recurrent, repetitive and persistent patterns (Feldman 2000). However, the factor of being stable has different meaning between ODRs and general routines. The stability provides ready-made solutions for employees to act efficiently. With the development of organizations, some routines will be changed to fit the organizational context. These changes could be partial (improvement routines) or complete (transformational routines) (Tranfield et al., 2000). Another kind is standard routines comprising the most observable way of organizations being run on daily bases (Tranfield et al., 2000). Another subset of routines is ODRs. These routines become inertial and resist changes. Rather than playing a vital role in organizational capability and efficiency (Dosi et al., 2000), this inertial characteristic in ODRs prevents rational reflection on automatic behavior and as a consequence this leads to counterproductive performance and reinforced errors.

ODRs can also be understood as "sticky" routines based on Howard-Grenville's description (2005). Howard-Grenville defined "sticky routines" according to the extent of their changes over time; a "sticky" routine is "very persistent; little impetus or change from within" (2005, p.633). Argyris (1986) explains this feature of ODRs with a three-loop mechanism: In loop 1 top line executives representing organizations bypass threats and the causes of threats; in loop 2 employees automatically adopt their own defensive routines to avoid the same threat which organizations try to avoid; in loop 3 employees reflect on counterproductive consequences by mainly blaming defensive routines from others rather than their own contribution towards them. The second loop nests inside the first one, and the third loop nests inside the second and the first. These three loops create a safety net

to protect people who are performing ODRs from embarrassment and threat. This "nesting" is a strategy that employees unconsciously employ to cover up embarrassment for their superiors and themselves. Therefore, they do not have motivation to change their behavior. ODRs make employees feel helpless and cynical about their ability to change. Therefore, organizations and employees try to engage with, avoid, or reduce ODRs. Instead, they reinforce ODRs and make ODRs extremely difficult to identify and change (Argyris, 1986). Without the awareness of producing ODRs, it is challenging for organizations to detect the barriers for learning by internal processes (Riley et al., 2013).

Routines have been considered to be changeable and open to variation (Cohen, 2012; Feldman, 2003). Employees who perform the routines have the choice of adjusting or altering them to match their own needs together with organizational issues at hand (Feldman and Pentland, 2003; Turner and Rindova, 2012). Howard-Grenville (2005) pointed out that the performing agents might ignore the feedback from reproduction of organizational routines in order to avoid changes generating embarrassment or threat. This leads to organizational inertia generated by ODRs. Argyris' (1990) example about changes on cost reduction program has clearly shown employees have the choice to generate change (or not). In the example, employees covered up the valid information for about one to three years, because they presumed that the organization does not want to change.

Some organizations change their routines on purpose to generate innovation (Jones and Craven 2001). Changes in organizational routines are especially evident when a crisis happens (Gersick and Hackman 1990) and they are essential for organizational

development. However, changing routines themselves will meet resistance from a majority of employees who are afraid of embarrassment and failure. A longitudinal study of 500 large Australian organizations during 1993 and 1996 revealed that employee resistance was the most frequently cited implementation problem encountered by management when introducing change (Bovey & Hede, 2001 cited by Waldersee and Griffiths, 1997). Bovey and Hede (2001) found that individuals with a tendency of resisting changes are also more likely to behave defensively toward change.

ODRs can be changed but this is restricted by the way these routines are formed and implemented unconsciously. It is known that routines are difficult to change (Cohen and Bacdayan, 1994). The changes of routines require organizations to reflect cautiously on behaviors, identify errors and correct these errors. However, organizations practicing ODRs try to cover up the errors automatically without reflection (Wilson, 2000). Employees or organizations practice routines as rational and natural (Hansen and Vogel, 2011). Also, employees tend to apply mixed messages which are inconsistent and ambiguous with respect to conveying uncomfortable information. Furthermore, ODRs, skilled incompetence and fancy footwork form a defensive routines pattern, and they are interactive and reinforce each other (Argyris, 1990). Skilled incompetence is the tendency of individuals to employ strategies that lead to counterproductive consequences automatically. Fancy footwork is the way that employees blame other individuals or organizations for the consequences of their own actions or deny their inconsistent actions (Noonan, 2007). The coexistence of these three elements in organizations creates difficulties for changing defensive patterns. In order to change ODRs, it is crucial to understand

what causes ODRs. Thus, the following section will review the literature on ODRs with emphasis on their determinants.

2.4.1 The differences between organizational routines and ODRs

The main difference between ODRs and organizational routines is the extent of their emphasis on stability and change. The above sections at this chapter show that the traditional view on routines was perceived as individual habit, performance programs and gene. This perspective is rooted in evolutionary theory. It considers routines to be inertial and inflexible. This views on routines have been challenged by many scholars recently (e.g. Feldman et al. 2016; Aroles and Mclean, 2016) and pointing out that the traditional view neglected the role of routine participants. The contemporary view on routines considers routines being the source of change and stable. That means routines are still building blocks of organizational capability by provide efficient solutions to certain issues (Becker 2004), but they provide source for change through the improvisation associated with routines (Aroles and Mclean 2016). This view becomes the well accepted by current researchers at routines. Based on the current perception on routines, the last sections explained characteristics of ODRs which share the feature of routines being stable instead of change. This characteristic of ODRs resisting change is analyzed by considering routine performers. Arygris (1990) and Morrison et al. (2000) posit that performers' perceptions on the negative consequences of revealing genuine opinions determines their routine behavior. Hence, employees at organizations with high ODRs tend to stick with the recognizable routines in order to avoid any blames. Individuals interact and independent to each other when perform a routine at organizations.

According to social exchange theory, individuals afraid to receive negative reciprocation if they do not follow social rules at organizations (Cropanzano and Mitchell 2005). When organizations contain high ODRs, individuals conceive that negative feedbacks are not welcome. Without receiving different ways of conducting the routines, changes are difficult to identified and implicated in organizations.

2.4.2 Elements that contribute to ODRs

ODRs arise because, most of the time, actors are not aware that their defensive actions contribute to counterproductive organizational performance. They perceive ODRs as rational things to do in order to avoid conflict and create a harmonious working relationship with others (Noonan, 2007). Argyris (1990) claimed that one of the reasons for ODRs to emerge is due to employees' unilateral control under the disguise of social norms such as avoiding upsetting employees, not to appearing negative and being supportive. However, all the actions they implemented are to protect themselves from failure and conflict (Cheng, 2011). Argyris generalized four principles guiding the defensive routines: (1) obtain unilateral control, (2) maximize winning and minimize losing, (3) minimize negative feelings, and (4) maximize rationality (1993, p.80). Generalizing from the existing studies, these four rules are enacted by three observable elements: dysfunctional communication, conflict avoidance and risk aversion. These three elements will be discussed in detail in Chapter 4. The second factor causing ODRs is organizational culture and norms that encourage employees to use ODRs to protect themselves and colleagues from embarrassment and threat. One example to demonstrate the issue is from Noonan's (2007, p.79-p.100) consultancy practice: the organization he was studying had a tacit

culture to encourage competition between departments instead of cooperation. When the operations department found a problem in a machine, the sale department was informed immediately to postpone customers' orders. Both departments only considered the interest of their own departments and made negative assumptions about each other. As a result, they were unaware of how their actions affect others and how their behavior was part of a larger system. Therefore, employees often failed to realize how well intended actions create counterproductive patterns of behavior in an environment which other departments' success is a threat to them owns instead of an opportunity of collaboration. The third factor could be individual embarrassment. Argyris's definition on ODRs indicates that ODRs are elicited during situations which can cause embarrassment and threat. Employees sense the situation and react based on their assumptions about the presumed consequences without testing their reasoning (Argyris, 1993). Therefore, it can be deduced that employees who are more likely to get embarrassed can contribute ODRs more than those employees who experience lower levels of embarrassment. The fourth factor that contributes to this defensive behavior is individuals' cognitive rigidity at work (Ashforth and Lee, 1990). Individuals' cognitions are "one of many important building blocks for understanding collective phenomena such as routines" (Felin, Foss, Heimeriks & Madsen, 2012, p. 1358). Cognition in organizations is about how individual members of an organization reflect upon their experience, make plans, or take action (Boland, Tenkasi and Te'eni, 1994, p. 456). Individuals who are prone to stay in their comfort zone and carry on with their routine performance are less likely to reveal the information that stimulates changes (Ashforth & Lee, 1990). From the elements that affect ODRs, it can be clearly seen that ODRs are a mix of individual, social, and organizational constructed phenomena.

2.4.3 Research on ODRs besides Argyris' work

Limited research has been conducted on ODRs following Argyris' seminal work (Argyris, 1985). Ritchie (1999) conducted a quantitative study in three different organizations regarding the relationship between communication and organizational defensiveness. She found that lack of communication is a predictor of organizational defensiveness. However, generalizability of Ritchie's finding related to ODRs is limited. The reason for this is the low reliability of the measurement construct used in the study. Nevertheless, Ritchie (1999) provides some initial attempt to quantifying these complex routines in future studies. Chiu (2006) applied Ritchie's scale of ODRs and found that total quality management (TQM) moderates the relationship between organizational defensive routines and double loop learning. Chiu pointed out that Ritchie's scale was not validated, yet he didn't conduct a series of validity tests before implementing the scale to his own study. Yau and Cheng (2010) also carried out a quantitative study in two transport companies in Hong Kong. Studying the three mechanisms of organizational defensive patterns originally developed by Argyris including ODRs, fancy footwork, and skilled incompetence, they suggested that ODRs impede organizational learning. These three mechanisms positively associate with each other and all have negative influence on organizational learning in varying degrees (Yau and Cheng, 2010). The finding confirms Argyris' theoretical suggestion on that these three mechanisms coexist and reinforce each other (Argyris, 1990).

Apart from these limited quantitative studies, some researchers try to conceptualize ODRs via case studies. Fontaine et al. (2012) suggested that ODRs should not be prevalent in Islamic societies due to their beliefs in sincerity to others and mutual consultation. This belief on sincerity does not encourage employees to cover up their true opinions for their own benefit; mutual consultation encourages members share ideas with one another. If these two beliefs are practiced effectively, they could reduce ODRs in the Muslim community. These two beliefs echo Argyris (1990) and Noonan's (2007) suggestions on solutions to reducing ODRs, i.e. advocating own opinions and encouraging other employees' queries on your opinions. Additionally, they used a short case to suggest that there are other methods such as distributed thinking and social awareness training to overcome ODRs besides Argyris's solution. Fontaine et al.'s (2012) study is the first study suggesting a cultural influence on ODRs, but it lacks empirical support. Noonan (2007) applied Argyris' theories on ODRs in his own consultancy experience. He identified ODRs in different levels of organizations with case studies, which clearly illustrated that ODRs are self-reinforcing processes resulting in unproductive conversation and delayed decision-making. Tranfield, et al. (2000) conducted an empirical research in nine manufacturing companies using case studies. They divided ODRs into four types based on how employees divert the blame or responsibilities, namely diverting defensiveness outwards (external to themselves and firms), diverting defensiveness upwards (senior teams); diverting defensiveness downwards (subordinates) and depersonalizing (computer, system). Their study showed that if ODRs are prevalent in organizations, organizational learning does not emerge until the force of ODRs are reduced or eliminated. Further research on ODRs was conducted by Yau (2013). Using interviews, she studied ODRs on women active in the engineering profession.

Her findings strongly support the view that ODRs hinder female engineering staff from learning. Riley et al. (2013) adopted a case study and found that defensive routines are not more prevalent in engineering manager participants than non-engineering manager participants. However, with the same method and size of sample, Riley and Cudney (2015) found that defensive routines are more commonly practiced among engineering managers than non-engineering managers.

The existing research mainly focuses on consequences of performing ODRs on organizational learning, yet the lack of a reliable measurement on ODRs raises some concerns with regard to generalization and the reviewed literature lacks large scale quantitative empirical evidence. The dominating findings about the negative effect of ODRs on organizational learning clearly portray that it is necessary to attenuate ODRs so that organizations can improve their capacity to learn and adapt to the current volatile market. Therefore, it is crucial to develop a scale to measure ODRs by following a rigorous process and apply the scale empirically to the field.

2.4.4 ODRs as barriers to organizational learning

Organizational defensive routines are claimed to inhibit learning and are overprotective toward organizations (Argyris, 2001). The issue of being counterproductive to learning can be explained drawing on two aspects. The first aspect is ineffective communication. Mixed messages are one manifestation of defensive routines happening most often (Noonan, 2011). People performing ODRs manipulate messages as ambiguous and inconsistent. As a consequence, validity of some messages either is lost or is interpreted wrongly due to the ambiguity. In

addition, people performing ODRs advocate their opinions with weak, unsupported and stereotypical arguments (Argyris, 1990), such as "trust me it is right", "I know the best" and "that is how our organization operates". These soft data are articulated in such an unsubstantiated way. They cover up the inference of their opinions and impede chances for other people to assess rationalities of the opinions. Hence, organizational defensive routines eliminate the opportunity of learning.

Another way by which ODRs hinder learning is self-censorship (Argyris, 1990). Organizations with ODRs possess a fear environment for sharing opinions, especially from subordinates to supervisors (Madrid et al., 2015). People privately censor negative information in order to avoid embarrassing other people or triggering conflict in organizations. However, this avoidance behavior may create temporary harmony in the working environment, yet it becomes haphazard for organizational learning. Hence, Senge (1991, p.254) pointed out that "the more effective defensive routines are, the more effectively they cover up underlying problems, the less effectively these problems are faced, and the worse the problems tend to become."

The second aspect to explain the counterproductive effect of organizational defensive routines to learning is based on characteristics of routines such as being mindless and automatic. One purpose of routines is to increase efficiency by reducing peoples' cognitive load to analyze repetitive issues (Cyert & March, 1963). Yet, repetitive and recurrent actions to similar stimuli can reduce people's vigilance on recognizing the negative result caused by some obsolete routines (Nelson & Winter, 1982). Recent works (e.g. Feldman & Pentland, 2003; Pentland & Feldman, 2012; Rerup et al., 2011) provide a more comprehensive perspective on conceptualizing routines.

These works posit that routines can be stable to increase efficiency, also can be a source of generating new routines. However, some routines like ODRs share more characteristics of routines being repetitive automatic and mindless, because people learn skillfully to avoid embarrassment and conflict from an early age (Noonan, 2007). This characteristic of being mindless and automatic makes ODRs seem legitimate for covering-up or bypassing problems in organizations. Without exposing organizational problems, organizations miss chances to solve problems in the early stages of ODRs.

2.5 The role of ODRs in Relation to Organizational Learning: A Theoretical Framework

Organizational learning has received substantial attention from both academics and practitioners. The number of publications on organizational learning has been phenomenal (e.g. Cohen and Levinthal, 1990; Crossan et al., 1999; Easterby-Smith et al., 1998; Levitt and March, 1988; Marengo and Pasquali, 2012; Swift and Hwang, 2013). Organizational learning is acknowledged as an instrumental factor for corporate competitiveness (Levitt and March, 1988). Therefore, researchers continuously attempt to find the factors that drive organizational learning. Some of the research explores organizational learning from a specific organizational context or connects it with organizational knowledge and innovation (e.g. Dodgson, 1993; Levitt & March, 1988; March, 1991). Despite scholars' foci on various factors influencing organizational learning such as social context (Antonacopoulou & Chiva, 2007), organizational context (Ashton, 2004), leadership (Vera & Crossan, 2004), cognitive trust (Swift & Hwang, 2013), employees' motivation, attitudes (Friedman,

2002), and personality (Back & Seaker, 2004), little research has investigated the mechanisms through which ODRs affect organizational learning.

Due to the multi-faceted nature of both concepts, this thesis combines micro and macro organizational variables contributing to organizational learning. For organizational factors, the researcher focuses on three organizational characteristics: age, structure and size. This is because structure is considered as an instrumental factor in organizational learning (Fiol & Lyles, 1985). Organizational learning varies with different structural arrangements (Martínez-León & Martínez-García, 2011). Structure is important for knowledge creation because it has a bearing on how people interact and communicate in organizations (Walsh & Ungson, 1991). Experience comes with age, and organizations learn from experience (Argote & Miron-Spektor, 2011). Hence, age could be an important factor contributing to organizational learning. Size is a most obvious indicator of organizational resources. Firm size has also been recognized as a key variable to affect organizational learning or a hindrance to organizational knowledge development (Marquardt and Reynolds, 1994). Based on these reasons, size, age and structure are selected to be predictors of organizational learning.

This chapter develops a theoretical framework about the relationships among ODRs, organizational learning and other organizational factors. The propositions developed here will be refined later in Chapter 5 and Chapter 6 after a systematic understanding on components of ODRs.

2.5.1 Organizational factors and organizational learning

Mintzberg (1983, p. 2) defined organizational structure as "the total of the ways in which its labor is divided into distinct tasks and then its coordination is achieved among these tasks". Coordination is achieved through controlling and integrating work activities in accordance with formal or informal rules (Child, 1972). Organizational structure is in a decisive role at how decision-making power is allocated (e.g. centralization), and how rules and procedures are used to facilitate learning (e.g. formalization; Bunderson & Boumgarden, 2010). By leading members' behavior, organizations can guide employees to work toward organizational goals. However, too much control of employees' can constrain employees' opinion about operational issues. Organizational structure also determines the channel of communication (Thompson, 1965). For example, if organizations have very clear rules and procedures guiding members' work tasks, less communication on tasks might be needed. In terms of organizational learning, Cohen (1991, p.135) posits that organizational structure is "a design of organizational learning, for acquiring information about the state of the world and for improving what the organization can do." Organizational structure is characterized by a variety of dimensions. The most common characteristics are formalization and centralization. Among others, previous research showed that centralization and formalization are decisive dimensions of organizational structure (e.g. Chen & Huang, 2007; Cosh, Fu & Hughes, 2012; Fredrickson, 1986).

Centralization. This concept contains a broad range of elements in the organization including layers of hierarchy, centralization of authority and horizontal integration (Dalton & Tudor, 1980; Damanpour, 1991). Centralization is characterized by the decision-making power being controlled by a small group people of organizations,

normally top managers (Damanpour, 1991). A centralized mechanistic structure naturally limits knowledge creation and knowledge sharing (Pertusa-Ortega et al., 2010). A less centralized structure is found positively related to organizational learning (lane & Lubatkin, 1998). Because the power is centralized in a small group of leaders on top of the hierarchy, this structure does not motivate employees to reflect on improvements or solutions (Pertusa-Ortega et al., 2010). In addition, most ideas or policies are discussed in small groups, which will restrict the development of diverse views on problems due to bounded rationality (Thompson, 1965; Simon, 1991; Secchi & Bardone, 2013). Bisel et al. (2012) argue that centralized structures constitute particular relational contexts that constrain interactions between supervisors and their subordinates supporting the argument that centralized structures are less suitable for organizational learning.

In organizations with centralized structures managers tend to fail to involve employees in the decision-making process (Damanpour, 1991). Hence, communication between management and general staff become limited resulting in reduced knowledge creation (Nonaka et al., 2000). Decentralized structures are more likely to enable the flow of information and innovation but hinder knowledge storing and limit the organizational memory. Though, organizations with decentralized structures have fewer rules and procedures, which could reduce the accumulation of individuals' tangible knowledge. When knowledge is not formalized by organizations it will disappear when employees change their jobs (Glisson & Martin, 1980). However, a decentralized decision making structure empowers the lower level employees to practice their autonomy and encourage freedom of sharing opinions (Nonaka et al., 2000). As a result, it allows flexible co-ordination for

completing tasks and responding to different situations. Decentralization encourages better communication across unit boundaries in the workforce which could contribute to efficient knowledge sharing (Willem & Buelens, 2009). Better interaction between employees could potentially reduce the loss of tangible knowledge caused by employees quitting their jobs or being made redundant.

Proposition 1a: *A centralized organizational structure is negatively related to organizational learning.*

Organizational defensive routines are a repetitive behavior which people perform to avoid issues related to embarrassment and threat (Noonan, 2007). Highly centralized organizations tend to generate environments characterized by high power distance (Mintzberg, 1983; Hofstede, 1991), as only a small group of people have the autonomy to make decisions. This power distance could be enlarged when defensive routines are in place. This is because people may think it could cause conflict or put their work in jeopardy, if they point out the flaw of decisions made by the organizations' top managers (Madrid et al., 2015). Therefore, debatable decisions made by a small group of people in a centralized organization might only be challenged in a subtle and opaque way resulting in covering up organizational problems (Argyris, 1990). Or, people may just keep silent (Morrison & Milliken, 2000). Consequently, defensive routines can hinder organizations with high levels of centralization from identifying problems. Without tracking organizational problems, organizations are unable to learn and will not improve the current way of operating.

Proposition 1b: *Organizational defensive routines moderate the negative relation between organizational learning and centralized organizational structure, such that the relationship is stronger when organizations have high organizational defensive routines.*

Formalization. This aspect refers to the extent to which employees' behavior is guided by rules, procedures and instructions (Schminke et al., 2000). Rules are a part of organizational routines which can be a source of stability and change, and they can provide solutions to problems efficiently (Feldman & Pentland, 2003). Formalization similar to routines can also improve co-operation and collaboration resulting in a better knowledge sharing and better organizational memory (Walsh & Ungson, 1991). However, in a highly formalized system, decisions are made in congruence with the legitimate rules or policies rather than in consideration with situation's need. It is in general associated with bureaucratic red tape (Kaufmann & Feeney, 2012) and is considered to be a hindrance to organizational development (Glisson & Martin, 1980). Hence, it has been argued that high formalization can drive out creative and proactive behavior (Fredrickson, 1986). The great degree of formalization reduces the creation of new competence (Martínez-León & Martínez-García, 2011). Formalization only allows decisions made around the formal systems and changes in decisions are likely to be incremental (Fredrickson, 1986). Repetitive practices on established procedures can reinforce established knowledge, but they constrain the opportunities of exploring alternative solutions to organizational issues at present. Especially nowadays with a dynamic business environment, organizations need to have a flexible structure to facilitate knowledge sharing among

departments. High formalization is empirically found to have a negative effect on organizational learning (Martínez-León & Martínez-García, 2011).

Proposition 2a: A formalized structure in the organizations is *negatively related to organizational learning.*

When organizations are swamped with defensive routines, people are more likely to cling onto established policies to avoid being blamed for mistakes. This results in bypassing and covering up organizational issues (Ashforth & Lee, 1990). When ODRs are high, rule designers tend to compose more rigid rules and procedures to stay in control (Argyris, 1990), which further restricts employees' behavior and discourages employees to share knowledge. Additionally, giving ambiguous messages are one common practice in organizations with ODRs (Noonan, 2007). This working environment could make employees feel psychologically uncomfortable as there is lack of clear expectation on their behavior. Accordingly, the positive effect of formalization on co-ordination and communication reduces, which results in deteriorated learning.

Proposition 2b: Organizational defensive routines moderate the negative relation between organizational learning and formalized organizational structure, such that the relationship is stronger when organizations have high organizational defensive routines.

Firm size. Organization size is among the strongest predictors of innovation and organizational learning and it operates as facilitator to innovation (Baldridge & Burnham 1975). Group size affect the way of interaction between individuals. The

larger the organizations get, the more complex forms of communication are required (Haveman, 1993). The communication in large organizations tend to be more formal than face-to-face. This could cause information to misinterpret, also great barriers for knowledge sharing.   Small companies tend to be more innovative than large companies (Camisón-Zornoza and Lapiedra-Alcamí, 2004). This can be explained by the fact that small organizations tend to have easier communication and more transparent decision-making in comparison to larger companies (Kotha et al., 2011). Large companies have the resources at their disposal to purchase the latest technology in facilitation of organizational learning. Therefore, it has been argued that large firms are in a better place to build networks with other firms and acquire available knowledge to remain competitive when confronting small and medium size firms (SMEs).   However, large organizations tend to be bureaucratically rigid creating inertia and constraining information sharing (Haveman, 1993). As a result, large organizations are more likely to be rigid than small organizations in terms of change. SMEs are found to be good at facilitating the sharing of experience, learning and innovation among its members (Nonaka & Takeuchi, 1995; Senge, 2006).

Proposition 3a: *Size* is *negatively related to organizational learning.*

Large firms have more resources to facilitate organizational learning, but they are likely to have rigid routines and structures that hinder organizational learning (Nelson & Winter, 1982). Larger firms are normally older firms. Senior managers in these two kinds of firms tend to maintain status quo on problem solving; they are more willing to invest on their existing routines than in new routines (Kotha et al., 2011). Improving existing routines without investigating the roots of problems will

just cover-up the drivers of problems temporarily. If the ODRs exist in organizations, they will reinforce organizations' way of bypassing the problems and prevent organizations from exploring solutions. High level of ODRs will create barriers for members to adopt abundant resources at their full potential. Organizations with ODRs tend to maintain their status quo and make decisions based on routines. This mechanical behavior will impede members to make good use of the vast organization resource for learning and innovation.

Proposition 3b*: Organizational defensive routines moderate the negative relation between organizational learning and size, such that the relationship is stronger when organizations have high organizational defensive routines.*

Firm age. Research has explored the effect of organizational age on other concepts related to organizational learning, such as innovation (e.g. Balasubramanian & Lee, 2008; Huergo & Jaumandreu, 2004; Sorensen & Stuart, 2000). However, little is known about how organizational age affects organizational learning. Organizations with a long history normally have accumulated standardized procedures and routines from successful experience. Their information supply proliferates, but mostly is acquired passively (Hannan, 1998). The vast experience facilitates employees' work performance and enhances organizations' capabilities, but it also traps organizations in a dilemma to give up their earlier competences to welcome alternative new solutions. Changing the current way of doing things is costly. Hence the status quo is more likely to be stable. Less experienced organizations try to be innovative, actively seek information and bravely experiment with new technologies because they have less experience and limited environment to rely on (Crossan et al., 1999b).

They are more likely to dive in and develop novel strategies to fit in the competitive environment (Balasubramanian & Lee, 2008). As organizations get mature, they are more likely to follow established patterns of communication and interaction. However, young organizations with centralized structures may inhibit an innovator's interaction with other members. From these arguments, it can be seen that organizational learning is affected by the age of organizations. Young organizations tend to initiate new ideas and implement them more efficiently than the older organizations. As a consequence, they enforce innovation and learning, while older firms consume more time for learning. In contrast to old firms, young firms are more willing to embrace changes and engage organizational learning.

Proposition 4a: *The age of organizations is negatively related to organizational learning.*

The aforementioned reasoning posits that old companies are more likely to be confined into convoluted rules and procedures, prior successful experience and complex bureaucracies (Le Mens et al., 2011). Additionally, moreover, former rules or procedures have been deeply rooted in old organizations and these could become part of their employees' unconscious actions in the workplace. Hence, old organizations are less inclined to explore radical changes on their current technology than young organizations (Kotha et al., 2011). This shows the feature of "stability", instead of "change"; the pressure for conformity would be high in old organizations. If ODRs are in place, "bad" routines will be camouflaged as being suitable for organizational development. This is because members in old organizations have been practicing the current routine for a long time and they are very comfortable with

what they are doing. They tend to reinforce the present routines in order to keep in line with other members. Hence, they are likely to neglect changes in the competitive environment (Thornhill & Amit, 2003). Additionally, old organizations have established self-esteem and self-identity which motives them to preserve the current routines (Brown and Starkey, 2000). Whereas, the existence of ODRs make organizational members feel anxious towards the learning, especially if the learning threats their self-identity. Furthermore, organizations with ODRs tend to practice rigid rules, which could aggregate already declining rate of learning at established organizations (Zahra, Sapienza and Davidsson, 2006). Consequently, the effect of age on learning will be affected by the existence of ODRs.

Proposition 4b: *Organizational defensive routines moderate the relation between age of organizations and organizational learning, such that the relationship is stronger when organizations have high organizational defensive routines.*

2.5.2 Individual personality and organizational learning

The literature of organizational learning shows that organizations learn through individuals. Individual personality traits have a direct effect on individual disposition at sharing knowledge (Borges, 2013; Matzler et al. 2008). Hence, individuals with appropriate personality in relation to the task might contribute more to improve overall organizational learning than individuals with a different personality. For example, high affective and cognitive trust among employees can increase knowledge sharing and benefit organizational learning (Hoe, 2007; Swift & Hwang, 2013). Self-realization and motivation are vital variables for organizational learning (Friedman, 2002). Research has also found that personality plays an

important role on job recruitment and academic achievement (Noftle & Robins, 2007). Back and Seaker (2004) posited that personality types are correlated with the style of learning people prefer. Personality traits are found to be a determining factor of learning styles (Furnham, Jackson & Miller, 1999) and predictor of academic outcomes (Noftle & robins, 2007). Thus, this research investigates the relations between the personality and organizational learning by using Big Five personality traits model. Big Five personality is considered as one of most parsimonious way to understand personality (Gupta, 2008).

The Big Five personality traits are openness, conscientiousness, neuroticism, extraversion and agreeableness (Digman, 1990). However, this work here only focuses on openness to experience, conscientiousness, and neuroticism. This is because the literature suggests that conscientiousness and neuroticism are robust and consistent predictors of job attitudes (Judge & Ilies, 2002). Openness to experience is often used to explain knowledge sharing and decision making in organizations (LePine, Colquitt and Erez, 2000; Matzler, Renzl, Müller, Herting and Mooradian, 2008). Therefore, these three traits should be particularly relevant in understanding the relationship between personality traits and organizational learning.

Open individuals are imaginative, open-minded, and original (Barrick & Mount, 1991). People with openness characteristics are likely to be creative in the workplace and have a positive attitude towards change. They enjoy learning new things and find using innovative methods to improve their performance is a pleasure (LePine et al., 2000). Openness may facilitate the novelty of efficient learning skills, but failed to follow the routine tasks (De Fruyt & Mervielde, 1996). In a meta-analysis, openness has proven to be a valid predictor of training proficiency but not job

proficiency (Back & Seaker, 2004). Individuals who are rated high in the openness trait are willing to expose their ideas, participate in discussion and engage in self-assessment that is necessary for learning in changing contexts (Barrick & Mount, 1991). High openness is not only positively linked with learning, but it also is a vital factor to benefit learning (Barrick & Mount, 1991). Research has shown (Matzler et al., 2011) people rated high in openness are better learners and contribute more to sharing new knowledge. High openness has the feature of being open-minded and welcoming assessment of their own ideas. Whereas, ODRs inhibit individuals from sharing their genuine feelings towards uncomfortable issues. Therefore, when ODRs exist in the organizations, it will hinder other members from opening up their opinions, giving valid feedback or generating productive queries. Consequently, ODRs will weaken the positive link between openness and individual learning. Thus, the researcher proposes:

Proposition 5a: *Openness to experience is positively related to organizational learning*

Proposition 5b: *Organizational defensive routines moderate the positive relation between openness to experience and organizational learning, such that the relationship is weaker when organizations have high organizational defensive routines.*

Conscientiousness includes volitional aspects that are related to one's willingness, diligence self-motivation and perseverance. It also includes a dependability aspect that is related to self-discipline, orderliness and cautiousness (Barrick & Mount, 1991). Conscientiousness has been the most consistent predictor of job performance

across a wide variety of job types among the five personality traits (Behling, 1998; Noftle & Robins, 2007). High conscientiousness has been identified as a significant characteristic of better learners and has been associated with personal attributes necessary for learning such as striving for success, being dutiful, exercising self-control, and being organized, dependable, and efficient (Chamorro-Premuzic & Furnham, 2003). High conscientiousness is not only contributing to better learning performance in stable environments but also in changing contexts (LePine et al., 2000). Perseverance is important in learning organizational routines and procedures to the extent that individuals must persistently practice the information and try to learn how to perform efficiently, even act mechanically at the end. Learning is likely to be higher for people who tend to be self-motivated, organized and goal orientated, especially during organizational changes. Individuals with low self-motivation and task commitment are more likely to abandon or lower the goal facing new challenges during changes such as learning new technologies or skills. Individuals with high conscientiousness tend to analyze all available information before making decision (LePine et al., 2000), that made them better learners and decision makers. However, organizations with high ODRs restrict valid information sharing between members and create goal ambiguity on tasks (Noonan, 2007). These negative effects on members' behavior could cause frustration for highly conscientious people with regards to achieving their goals. Additionally, it is likely to result in less learning. From the reasoning above, the researcher proposes:

Proposition 6a: *Conscientiousness is positively related to organizational learning*

Proposition 6b: Organizational defensive routines moderate the positive relation between conscientiousness and organizational learning, such that the relationship is weaker when organizations have high organizational defensive routines.

Neuroticism is often associated with the sense of being anxious, depressed, angry, embarrassed, emotional, worried and insecure (Judge et al., 2002). Especially when employees face changes in workplace, they tend to get so stressed and fear that they choose to quit or resent their jobs (Judge & Ilies, 2002). Neuroticism in most cases is negatively correlated with work performance (Colquitt et al., 2009). This is because individuals with high neuroticism cannot cope with stress and threat as well as individuals with low neuroticism. Learning is not always pleasant. People with high neuroticism may find frustration to replace the existing knowledge or share new knowledge. This negative attitude towards change continue until 'not-learning' becomes an obvious barrier to the organization's development (Coutu, 2002). Based on the characteristics of high neuroticism, it can be inferred that people with high neuroticism are less likely to initiate change and share ideas contributing to improve current routines. With the tendency of anxiety and being depressed, individuals scoring high on neuroticism will contribute less to learning than individuals with low neuroticism. Organizations with high ODRs create an environment in which negative information and uncomfortable issues should not be openly discussed (Holmer, 2013). The latter makes highly neurotic individuals feel that it is rational not to share knowledge or reveal some crucial knowledge relating to errors of current routines (Gupta, 2008). Thus, the researcher's final set of propositions is:

Proposition 7a: Neuroticism is negatively related to organizational learning

Proposition 7b: *Organizational defensive routines moderate the negative relation between neuroticism and organizational learning, such that the relationship is stronger when organizations have high organizational defensive routines.*

Figure 1 summarizes the proposed relationships. It displays the relationship between variables including organizational factors (centralization, formalization, size and age), individual factors (openness to experience, conscientiousness and neuroticism), ODRs and organizational learning. The propositions developed here will be refined into hypotheses in the later chapters.

Figure 1: Conceptual Framework of the study
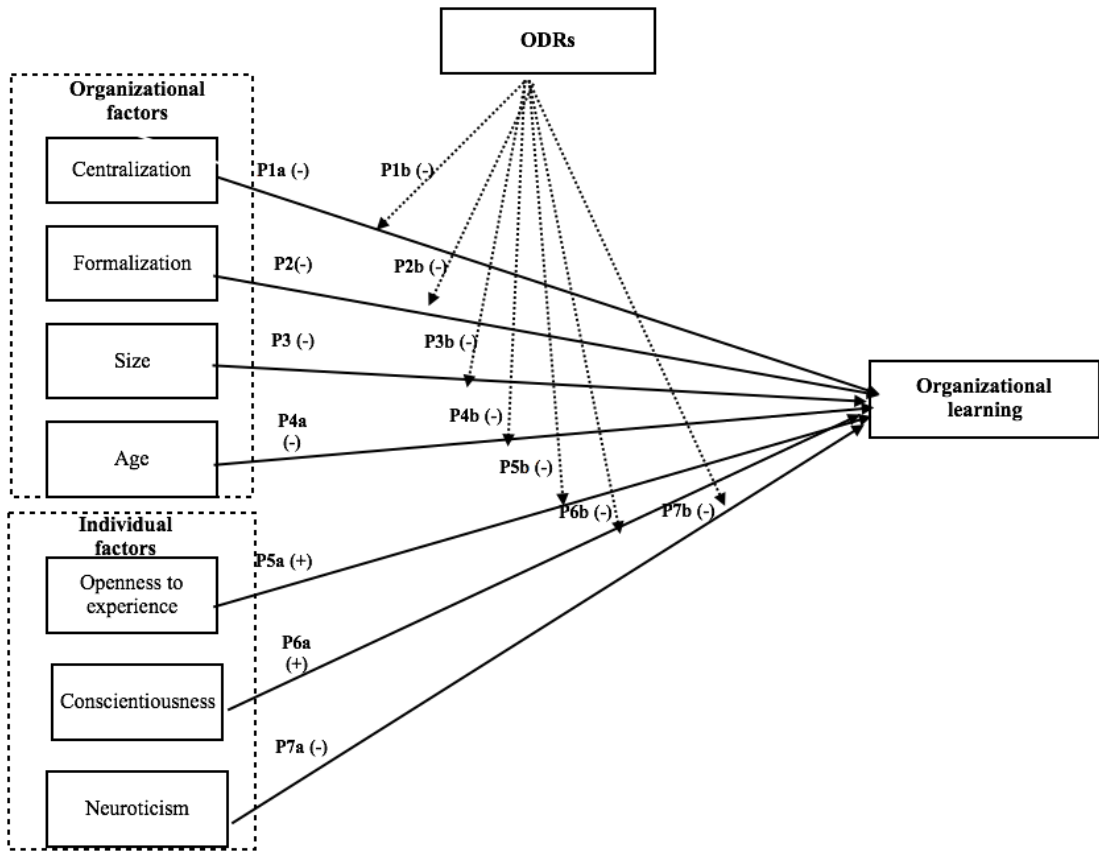
Note: solid lines represent direct effects while dotted lines are moderation effects.

2.6 Theoretical Contribution of the Framework

Apart from Argyris' seminal works on ODRs, not much research has been developed in the area. One contribution of this chapter is that it raises academics' awareness of ODRs. This serves the purpose to trigger more attention and future enquiries in this area of research. Additionally, not only has this chapter reviewed Argyris' and other scholars' work on ODRs—such as the characteristics of ODRs, determinants of ODRs and understanding ODRs in the context of general organizational routines— but it also has brought in new perspectives to analyze ODRs as a moderator of the relations that organizational and individual variables have with organizational learning. Theory suggests that ODRs can contribute to explain why organizational learning does not proceed as expected by most organizations, despite the provision of learning resources. The model could provide a stepping stone for researchers working towards capturing the effects of ODRs empirically.

Second, this is a first study to provide a nuanced understanding on how organizational learning is affected by ODRs. For example, the study deduced that learning ability decreases with the age of organizations. ODRs moderate this relationship. This means that organizational learning will be negatively affected by ODRs at old organizations despite their rich resource and experience. This clearly highlights the importance to think about reducing ODRs in old organizations. Third, the study extends the theory of organizational routines by identifying the particular characteristics of ODRs and positioning them in the larger literature on routines. Routines have two characteristics: they are simultaneously stable and changeable. Studying ODRs delineates that these two features are not balanced all the time.

Particularly in the study of ODRs, the analysis has highlighted that ODRs tend to be inert and resistant to change. Routines are recognized as a principal engine for the work that organizations accomplish, or are treated as knowledge-based reservoir for organizations to regenerate (Cohen et al., 1996; Turner & Rindova, 2012). This research claims that ODRs can be a barrier for organizational development.

Third, the chapter theoretically explained the relationship between organizational routines and organizational defensive routines. It clarified the characteristics of ODRs, which benefit the future research at building up compositions of ODRs. Clear understanding on the concept also provides a solid foundation for future research to explore the effect of ODRs. The comparison of organizational routines and ODRs indicate that some routines tend to be more inertial than others. In order to implement new routines, the ineffectiveness of old routines have to be communicated in organizations. This means reducing ODRs is a crucial step for changes at routines.

2.7 Implications of the Theoretical Framework for Practitioners.

The proposed moderating effect on organizational and individual learning benefits managers in organization to realize that ODRs can interfere with institutional learning at all levels. It suggests mangers should not only devote themselves on improving their organizational resources, personal selection or training, but also try to identify and reduce ODRs. If ODRs are not contained, organizational learning generated by other factors will be reduced and the core reasons of organizational problems tend to be covered up temporarily. Eventually, covered up problems will damage organizations further in long term.

Emerging from the theoretical arguments above is stability as a key feature of ODRs. Stability in ODRs is different from stability in general routines. The main function of stability for routines is that work can be coordinated more efficiently. It also serves as a memory for organizational learning. However, stability in ODRs becomes a resistant force for organizational learning or change. Managers should recognize the damage ODRs could unconsciously do to impede organizations' development. Even with awareness of ODRs' existence in organizations, managers should also know that introducing changes in ODRs is difficult. This is because the resistance of changes in ODRs is related to the inconsistence of understandings about how organizations operate. It is further related to the performances that create and maintain these understandings (Feldman, 2003). As a result ODRs prevent members from revealing valid, but negative information related to improving organizational effectiveness (Argyris, 2002). This deception will hinder organizations to recognize the need for change.

2.8 Limitations of the Theoretical Model and Outlook

Several limitations and opportunities for future research can be identified from this research. Here the researcher reviews the limitations first, and conclude with ideas for further research.

Although the study analyzed three very important organizational characteristics, other organizational characteristics may be considered in future works. For example, if large organizations have a good appraisal system to motivate members to share their ideas and encourage innovative methods to compete their tasks, they might be able to set up mechanisms to assist learning.

In terms of individual characteristics, the conceptual framework also only explored three personality traits. However, other individual factors like level of education and age may play role in relation to learning and ODRs. Argyris studied highly educated professionals and found that some of them tend to become defensive. This is because they rarely fail, so that they cannot take failure and criticism easily. They feel embarrassed to admit that they made mistakes or they lack knowledge in some area (Argyris 1991). Overall, they are not used to receive critical feedback. Similar conditions have been identified to cause overconfidence in CEOs (Malmendier & Tate, 2008). Thus, the inclusion of further personality variables is a promising way for future research.

Another limitation is that this conceptual model neglects the cognitive mechanisms affecting organizational learning. Many researchers of OL, such as Huber (1991) and Crossan et al. (2011), pointed out that cognition plays an important role in acquiring and distributing knowledge in organizational learning processes. Cognitive mechanisms partly explain the reasons why people automatically follow routines or create ODRs. Some of these reasons have been studied such as bounded rationality (e.g., Clark, 2008; Gigerenzer & Selten, 2001; Secchi & Bardone 2013). Simon (1991) discussed how individual bounded rationality affect individuals at transferring information to organizational level. Individuals not only rely on their experience to guide their behavior, but also apply their experience to foresee the future scenarios outside their context (Felin et al. 2012). The researcher is also aware of the fact that learning is not only about changing peoples' action or their feelings. Fundamentally,

it needs to change the cognitive rules or reasoning they applied to design and implement their actions. Hence, there is scope for further expansion of the model.

2.9 Chapter Summary

This chapter systematically reviewed the relevant literature about organizational learning, routines and organizational defensive routines. A theoretical framework is developed based on the literature. The framework is composed by two parts. One part is about the relation between organizational factors and organizational learning; the other part is about the relation between individual factors and organizational learning. In order to make the argument easy to follow for readers, the framework will be tested separately in two empirical studies (Chapter 5 and Chapter 6). The prerequisite for empirically testing the framework is to have a scale to measure ODRs. A review on the current research did not reveal a reliable scale measuring ODRs. Hence, before conducting empirical studies, Chapter 4 explains how the scale of ODRs is developed. The following chapter will discuss methodology of the study.

CHAPTER THREE: Methodology

3.1 Introduction

The conceptual underpinnings of the researcher's model have been presented in Chapter 2. Chapter 3 now presents the methodological approach taken in Chapter 4 (ODRs scale development), Chapter 5 and Chapter 6 (empirical tests of the theoretical model). Since multiple samples were required for scale development and empirical testing the respective details on samples, measurement and analytic techniques are presented in the respective chapters. This Chapter focuses on providing an explanation on the researcher's decision on research paradigms and choice on the methodological approach. Briefly it summarizes the issues of all the studies in terms of samples and measures. As understanding the different research paradigms is prerequisite for conducting a research in order to have a proper research design, this chapter will first start comparing the different research paradigms, and then proceeds explaining the choice of paradigm and the choice of research method taken for this study.

3.2 Research Paradigms

A research paradigm refers to "a set of basic beliefs (or metaphysics) that deals with ultimate or first principles. It represents a worldview that defines, for its holder, the nature of 'the world', the individual's place in it, and the range of possible relationships to that world and its parts." (Guba & Lincoln, 1994, p. 107). Simply put, the research paradigm is about how researchers view the world (Jonker & Pennink, 2010). It provides guidance for the process of research design. The paradigm addresses three fundamental questions (Punch, 2014, p. 15): "(1) What the reality is like (ontology); (2) What the relationship is between the researcher and the

reality (epistemology); (3) What methods can be used for studying the reality (methodology)." The way of answering the three questions are intimately related. For example, the researchers' view of real world (epistemology) decides the methods which are used to understand the world. The former is a philosophical, the latter is a more practical question. There are different categories and boundaries of paradigms. This section explains three paradigms, positivism, critical realism and interpretivism.

Positivism is a paradigm using scientific methods to advocate the application of the natural science to study social reality and beyond (Bryman, 2012). Positivists postulate that a social world external to individual cognition can be studied through direct observation and measurement (Burrell & Morgan, 1979). Deductive reasoning is applied to generate hypotheses based on the existing theory. Structured survey and data collection techniques are most often chosen to test hypotheses (Saunders et al., 2012). It is instrumentally important for positivists to select an instrument reflecting the reality. Therefore, researchers adopting positivism need to present the reliability and validity of the chosen instruments before contributing their findings to the existing knowledge (Brannick & Coghlan, 2007). While positivist researchers analyze and interpret data, they should remain as objective as possible. Traditional positivists believe in the absolute truth of knowledge which is independent from researchers themselves (Creswell, 2013). Over the past century, positivism has been a dominating approach for studies of social behavior. However, the debate about the appropriateness of applying natural science models for the study of society also has been long standing, because studying social issues is more complicated than studying physical objects (Bryman, 2012). Furthermore, positivism seems to face a paradox to control both researchers' bias and nature's tendency to confound (Guba, 1990).

Post-positivism is a modification of positivism which attempts to limit the weakness of positivism, but it still believes in the existence of a true, objective reality in the world (Bagozzi, Yi and Phillips, 1991). It still has a creed that reality can be observed objectively through instruments and nature still can be predicted from causes and outcomes via a scientific formulation (Bagozzi et al., 1991). However, post-positivists admit that it is impossible for humans to discover the ultimate truth due to humans imperfect sensory and intellectual mechanisms (Guba, 1990). Hence, what we see is only part of the big picture (Saunders et al., 2012). There are two main differences between positivism and post-positivism (Saunders et al., 2012). First, while post-positivism agrees with positivism in that the real world can be observed and measured, it critically points out that observation cannot be totally independent from researchers' value and bias. Second, positivism perceives the world is relatively stable and business operates on one level. In contrast, post-positivism recognizes that the social world is constantly changing and business issues should be studied at multiple levels.

Critical realism is another philosophical stance that believes the social events can be studied via a scientific approach. Different from positivists who believe researchers' conceptualization of reality can directly reflect the reality, critical realists believe that the reality is indirectly observed through data collection and explanation. Because it is indirect observation, categories which are adopted to disclose the reality are considered to be provisional in nature (Bryman, 2012). Critical realists work on an identification of a generative causal mechanism which serves to explain observed reality via either qualitative or quantitative research methods.

Interpretivism which is also combined with constructivism is considered as an alternative to positivism (Bryman, 2012). Interpretivists believe that individuals seek understanding of the world from their subjective experience. This understanding is gained from qualitative methods, such as interviews, through which researchers gather views from interviewees. It is crucial for researchers to have empathy so that they can understand the views from other peoples' situations. The construction of the reality with this method is formed through the interaction between research subjects and researchers. The interpretation of the views is influenced by researchers own historical and social perspectives (Creswell, 2013). Hence, researchers often acknowledge the process of the interaction among individuals. Different from positivism which deductively hypothesizes relationships between variables based on the existing theories, interpretivism aims to make sense of the meaning of the world from others' views. Instead of starting from theories, interpretivists inductively build theories from data.

3.2.1 Choice of research paradigm

From the discussion of different paradigms above, it would be a mistake to think one paradigm is better than another. The choice of paradigm should be based on the following three aspects (Saunders et al., 2012). Firstly, the chosen research paradigm serves researchers to solve research questions. Additionally, it should fit the assumptions researchers made about what the reality is (ontology) and what the relationship between the world and the researcher (epistemology) is. Finally, the researcher's own experience and values also play a role when choosing a research

paradigm.

The research objectives in this study emphasize the empirical relationships between different variables, which fits the positivism way of perceiving the real world. Also, given the researcher's own values on the real world and her experience on applying mathematical methods for assessing social issues, positivism seemed a more appropriate philosophical stance for this study than others. Nonetheless, the researcher believes that it is impossible to find ultimate truth, and the unobserved truth is restricted by researchers' knowledge, bias and other external factors (Guba, 1990). Consequently, the post-positivists' position that the social world is constantly changing is in line with this study's purpose about understanding how organization's learning behavior changes under the influence of other factors. Furthermore, the researcher also believes that it is important to study organizational learning from multiple levels rather than from a single level. Hence, based on the three reasons addressed, post-positivism is better to answer the research questions, and it is consistent with the researcher's way to interpret the real world. Despite the reasoning on the choice of post-positivism, the researcher is also aware of the limitation of using hard data and highly structured instruments to study human related issues like one would study physical objects. However, compared with other paradigms, post-positivism is the most appropriate for the study.

3.2.2 The choice of a quantitative approach

The discussion on the research paradigm shows that the choice of the research approach depends on the research questions and the choice of philosophical stance.

The research questions of this study are deducted based on the existing theories and aims to examine the relationship between variables of interests. Additionally, the choice of post-positivism also guides the researcher to adopt a quantitative approach, as the researcher believes the relationship between variables can be verified through analyzing hard data objectively. Previous studies on ODRs mainly rely on action research (e.g. Argyris, 1990; Noonan, 2007). This implies that most of the existing knowledge on ODRs is extracted from reflective accounts of researchers' consultancy experience. But data driven empirical insights have not been gained yet. This is due to the fact that as consultants, they are hired to identify problems and provide solutions, which requires collaboration between researchers and members of a research site. These well-documented qualitative studies provide a great detail to assist the research to establish the theoretical relationships between variables. Empirical verification through a quantitative study will respond to the criticism of action research which is considered as lacking rigor and being too partisan (Punch, 2014). Additionally, the objective of this study is not to provide solutions or to observe the changes of employees' behavior, but to empirically test the established theoretic relationships between variables. Hence, the quantitative method is the most appropriate for this study.

3.2.3 Data collection method

The field of quantitative design mainly involves two strands, namely experimental design and non-experimental design. Experimental design serves as a base for establishing cause-effect relationship via comparisons between groups. Researchers need to manipulate the independent variable in order to determine whether it has

influence on the dependent variable. Due to the difficulties of controlling all the factors influencing the dependent variable, experiments face threats to external validity of an investigation (Bryman, 2012). Additionally, studies on social psychology often apply laboratory experiments. The setting of the laboratory is likely to be different from the real-world. Hence, it is challenging to establish how well the findings are applicable to the real world. However, replicating the controlled environment of experimental laboratories is rarely possible in organizational settings. Hence, this is the reason why non-experimental design, such as survey research, prevail in quantitative organizational studies (Punch, 2014). With this design, researchers statistically control variables which are related to independent variable, or dependent variables.

There are two reasons for why this study chooses a non-experimental design. First, the independent variables (organizational size, age and structure and individual personality traits) in this study are unrealistic to be manipulated. The second reason is related to research questions and objectives. This study is exploring the patterns of the association between variables such as organizational learning, ODRs, organizational factors and individuals' personality rather than establishing cause-effect relationship. The effect's direction here is inferred from the theory as explained in previous chapters. Third, the relationships between variables are theoretically established based on existing literature. This study attempts to find empirical support for the theoretically proposed relationships. Based on these three questions, the non-experimental design is most appropriate choice for this study.

3.2.4 The choice of survey questionnaire

The design of questionnaires can differ based on how they are administered (Oppenheim, 2000). There are two main ways of administering questionnaires. One is self-administered questionnaires which can be administered electronically using the internet or handed/mailed to respondents. The other one is interviewer-administered questionnaires which could be done through the telephone or meeting. The questionnaires of this study are mainly administered electronically using the internet through a research company, Qualtrics. Only a small amount of data is collected by the paper-and-pencil survey method.

Online surveys are used in this study, which solved the problem of getting access to various organizations at a low cost. However, it is inevitable to have weaknesses as any other method. First, the survey could be assessed by a large number of unknown individuals (Schmidt, 1997). Though the researcher attempted to eliminate the unqualified respondents by restricting their characteristics, respondents can fake their identity (Wright, 2005). Second, long questionnaires could cause the possibility of 'respondent-fatigue'. Third, respondents may submit the set of questionnaires multiple times due to mistake or deliberation (Schmidt, 1997). Regarding the listed information, effort has been put in questionnaire design to reduce the limitation inherited from using questionnaires. For example, the researcher arranges the survey on multiple pages instead of listing a long survey on one page. This reduces respondent-fatigue. The researcher also restricts respondents to submit the survey twice from the same computer by a setting in the survey system. In addition, the researcher also strategically arranges the dependent variables and independent variables on different pages in order to avoid the possibilities that the respondents fill

in the survey according to social desire instead of genuine information (Bryman, 2012).

3.3 Questionnaire Design

This section provides an overview of the measurements used for the three studies and layout of questionnaires and sampling issues.

3.3.1 Measurement of the variables

Chapter 5 and Chapter 6 will explain the measurements of independent variables and a dependent variable. In order to avoid duplications, the researcher decided not to present all the measures in this chapter. However, this section summarizes the measures, their sources, reported Cronbach alpha from their original sources and Cronbach alpha from this study. All of these pieces of information are displayed in the following table 1 and table 2. Cronbach's alpha for all the variables have reached the most referenced threshold, 0.7. The exception is 'formalization', which presents a Cronbach alpha of 0.63. Two reasons lead me to believe the reliability of 'formalization' is appropriate. First, a scale with Cronbach alpha less than 0.7 is considered acceptable, if it has less than five items (Nunnally, 1978; Peterson, 1994). Second, the formalization measure frequently falls short of the 0.7 threshold but has still been used in various studies (see. e.g. John, 1984; Feeney, 2012; Levin & Cross, 2004). Thus, the researcher takes it forward to the analyses.

Table 1: Summary of the Measures for the Empirical Study at Chapter 5

Variables		No. of items	Source of scale	Reported alpha	Chapter 5-study alpha
Independent variables	organizational size	1	N/A	N/A	N/A
	Organizational age	1	N/A	N/A	N/A
	centralization	5	Ferrell and Skinner (1988)	0.82	0.88
	formalization	2	Ferrell and Skinner (1988)	0.75	0.63
Dependent variable	Organizational learning	13	Lopez, et al. (2004)	0.9	0.91
Moderating variable	ODRs	8	Newly developed by the researcher	N/A	0.76

Note: N=358, ODRs= organizational defensive routines.

Table 2: Summary of the Measures for the Empirical Study at Chapter 6

	Variables	No. of items	Source of scale	Reported alpha	Chapter 6-study alpha
Independent variables	Conscientiousness	9	John and Srivastava (1999)	0.82	0.83
	Openness to experience	10	John and Srivastava (1999)	0.81	0.77
	Neuroticism	8	John and Srivastava (1999)	0.84	0.83
Dependent variables	Organizational learning	13	Lopez, et al. (2004)	0.9	0.91
Moderating variables	ODRs	6	Newly developed by the researcher	N/A	0.74

Note: N=351, ODRs= organizational defensive routines at individual level

3.3.2 Layout of questionnaires

The way of structuring questionnaires can reduce common method bias, and it could also make the questions easy to follow for participants. Common method bias arises because of common method variance, which is the variance "attributable to the measurement method used rather than to the constructs" (Podsakoff, MacKenzie, Jeong-Yeon & Podsakoff, 2003, p. 879). Thus, Bryman (2012) suggests researchers spend some time considering the design of questionnaires. All the questionnaires in this study had a cover letter at the beginning which informs the respondents about the purpose of the study and indicates that respondents can drop out anytime of their own will. The cover letter also assures respondents that there are no right and wrong answers, and promises respondents to protect their anonymity. These assurances will make respondents less likely to answer the questions to be more social desirable and lenient (Podsakoff et al., 2003). Following the cover letter, there is demographic information. These questions are easy to answer so that they motivate participants to proceed onto the next sections. The web-based survey tool enabled me to apply a function which allows to randomize items. This helps to reduce priming effects and also reduces common method bias.

3.3.3 Population and sample

The study relies on the individuals' perception to measure organizational behavior. Hence, the population of the study is composed of individuals who work in different industries at UK organizations. This way of collecting data is to avoid the possibility of obtaining homogeneous population on the common factors. That could restrict the

generalizability of understanding ODRs. In order to make sure individuals to have sufficient knowledge about their organizations, the research restrict participants' tenure being more than one-year. By doing this, it can avoid issues that respondents deliberately guessing answer (Saunders et al., 2012). Considering organizations which have been operation for one years may not have established certain structure, they are also eliminated from the sample. The sample for each empirical study is comparably large. The details of the sample are described in the respective chapters accordingly. However, readers should interpret the findings with caution in terms of the generalizability.

3.3.4 Pilot test

Apart from the newly developed ODRs scale, the measures of this study are well tested by existing research. The newly developed scale of ODRs has gone through various tests for checking reliability and validity before they are applied for empirical studies. Hence, only small scale pilot tests are carried out before launching the main survey. Because the purpose of pilot tests is to improve the version of final survey in terms of data-collecting routines, scoring techniques, deficiencies of the instrument (Bryman, 2012). It is also helpful to check how long it takes respondents to answer the questionnaires in order to avoid fatigue. Hence, 15 respondents participated are randomly selected from a university. These samples are not used for the main studies. As a result of the pilot study, the research made some changes to make the questions more precise. For example, originally job positions are only divided into two levels (supervisory level and non-supervisory level). Following the comments received on the pilot tests, they are divided into five levels (general staff,

supervisory/first line manager, middle level management, senior level management). The questions about age and size of organizations originally require respondents to give an exact number, but pilot tests showed that people only roughly knew the information. Hence, these two questions were modified into categorical types. Additionally, one item of measuring organizational learning included an outdated technology (Lotus Notes) as an example, the researcher changed it into the more recent Microsoft SharePoint. Apart from the changes related to item designs, the researcher also conducted some minor changes on wording and typo issues. After all the improvement based on feedback from pilot tests, the questionnaires are sent to Qualtrics which shared the links to potential respondents.

3.3.5 Sampling techniques and size of final samples

The sampling techniques depend on research objectives. One objective of the study is to develop a scale before conducting empirical studies. It requires larger and independent samples than single empirical studies. The researcher contacted a few organizations and encouraged them to participate in the data collection. However, all the effort ended up to be in vain. Considering the timeline and possibility of obtaining multiple samples, the researcher decided to entrust Qualtrics to approach potential qualified respondents.

Figure 2 streamlines the process of data collection. In terms of sample 1, the researcher managed to collect 106 samples contributing to the scale development. However, 106 samples are not large enough for conducting exploratory factor analysis (EFA). Then the researcher resorted to Qualtrics for help at data collection. The data is illustrated at Figure 2 named as sample 2. With the given instruction on the characteristics of respondents from whom the researcher wished to collect data, the researcher has tried to improve the reliability of data. Then respondents self-administer questionnaires which is unlikely to cause social desirability (Dillman, 2007). In consideration of cost, the research required to collect 400 completed questionnaires. Then the sample would be large enough be split into two parts for EFA and Confirmatory Factor Analysis (CFA). This process of data collection resulted in 410 respondents. The researcher drew 114 from the sample and combined those responses with the samples collected before. As a result, the sample for conducting EFA was 220. Out of this sample, the final usable data was 207.

With the remaining sample of 296 collected via Qualtrics, the researcher carried out CFA. Excluding outliers and unengaged respondents, the final usable data was 288. "Unengaged respondents" refers to those people who scored the same value for most items across the whole questionnaire. In these cases the assumption is made that they completed the survey without engaging with the questions. Including these samples in the study could have significant effect on the conclusions that can be drawn from the data. After both EFA and CFA test, the research conducted another data collection is for convergent, discriminant, predictive validity and measurement in various tests. The researcher could feed in a few scales to the survey for another research project[3] (carried out by some colleagues). which generated 301 responses composed of 151 UK respondents and 150 US respondents. The advantage of combining the scale with other different constructs on the questionnaire can reduce common method variance (Podsakoff et al., 2003). The data collection and different samples are visualized in in Figure 2.

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[3] Another research project was about public motivation

Figure 2: An Overview of Data Collections for the Thesis
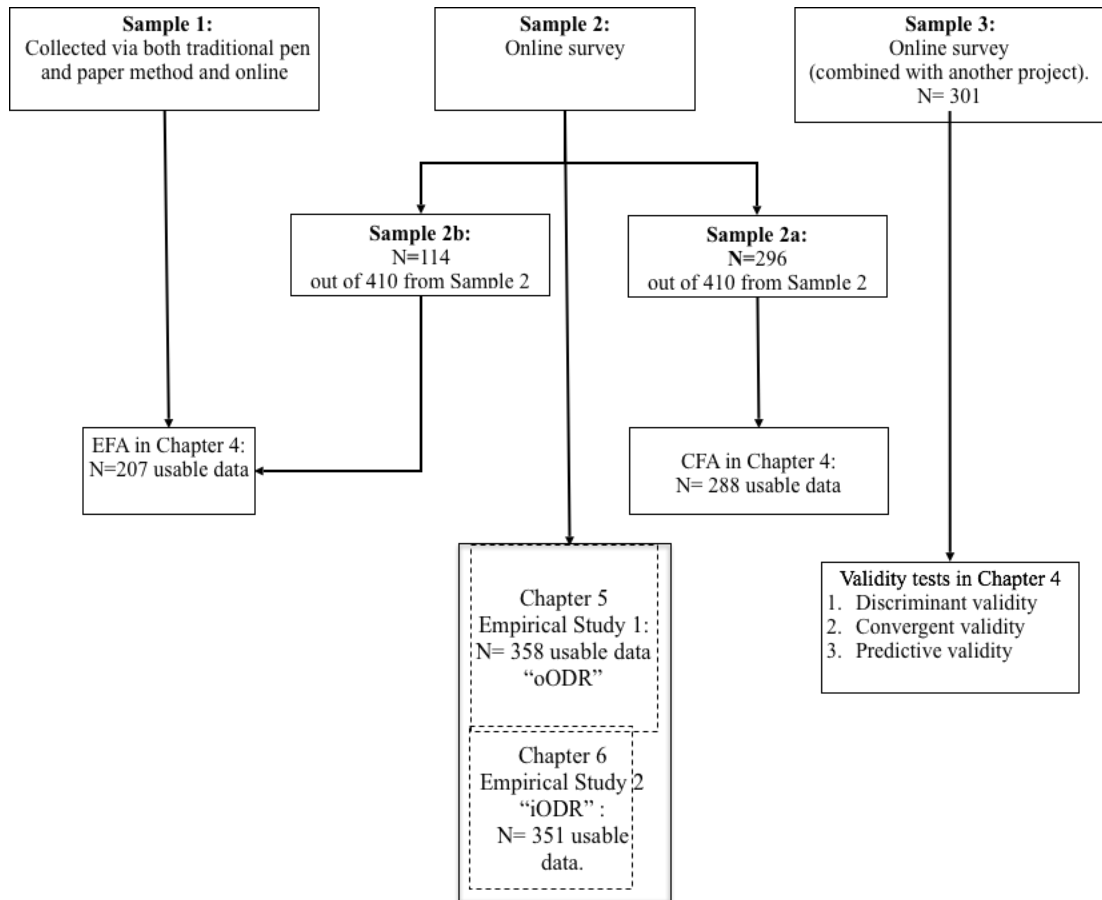
The advantage of using a web-based survey provider is to get access to potential respondents in a quick, easy and inexpensive way (Goodman, Cryder & Cheema, 2012). A web-based survey also allows researchers to obtain large samples which traditional techniques find challenging to collect (Gosling, Vazire, Srivastava & John, 2004). The biggest disadvantage of using a web-based survey provider is that respondents are self-selected into the pool of respondents from the survey provider. These respondents get monetary compensation for completing the survey. However, the quality of data is not affected (Buhrmester, Kwang & Gosling, 2011). The research compares findings of studies based on both web-based data and traditional

techniques, and shows that reliability of data is similar to the traditional paper-and-pencil methods (Goodman et al., 2012; Vazire et al., 2004).

3.4 Data Analysis

Before data analysis, the researcher has carried out a series of data screening checks to ensure that the data is clean. First the researcher checked the missing data to see if there is systematic reason to cause some data to be more missing than others. The amount of missing responses in each of the data sets are less than 10%. Hence missing data does not affect inference of the findings (Field, 2013). Then, the researcher inputted the data and replaced missing data with mean (see details in Chapter 4, Chapter 5 and Chapter 6). Outliers are also checked by using boxplots. Boxplots is a method to graphically display the behavior of the data. If a value of a variable is beyond the box, it is considered an outlier. The researcher treated these variables as missing values. After running all regression analyses, four assumptions related to linear regression are checked before the further data analysis, namely normality, linearity, homoscedasticity and multicollinearity.

In terms of data analysis, various methods have been adopted to test hypotheses and verify the scale of ODRs. For scale development, EFA was used to explore the underlying factors and SPSS Amos 22 was used for confirmatory factor analysis. When conducting the analyses, the researcher followed the recommendations provided in Byrne (2001). SPSS was applied to test the relationships deduced from hypotheses. The methods applied include Pearson Correlation and Multiple Linear Regression (MLR). MLR is used because the study wants to understand the relationship between a number of independent variable and one dependent variable. Field (2013) was consulted for the application of MLR.

3.5 Conclusion

This chapter first discussed the differences between the main three research paradigms, then provided the reasons why post-positivism is appropriate for this study. Considering the research questions and the choice of research paradigm, a quantitative approach was adopted for this research.

Variance statistics were used to establish the reliability and validity of the newly developed scale for measuring ODRs such as, EFA, CFA, discriminant and convergent validity test and measurement in various tests. Multiple regression is applied to assess the relationship between different variables for predictive validity. CFA is used again for cross-cultural measurement invariance.

As described above the researcher followed best practice recommended by Bryman (2012), Field (2013), and Byrne (2001) in order to meet standard levels of rigor in research design and analyses.

CHAPTER FOUR: ODRs-Scale Development[4]

In order to test the theoretical models developed in Chapter 2, it is prerequisite to have a scale to measure ODRs. However, the existing literature does not reveal a reliable measurement of ODRs. This chapter is to explain the process of measurement development.

As already stated at pervious chapters, ODRs are defined as any actions and policies that prevent employees and organizations from experiencing embarrassment and threat. ODRs research lacks in diagnostics, testing and generalizable results due to its heavy reliance on qualitative method. This chapter aims at covering this gap by developing a scale to measure ODRs from individuals' perceptions at both the organizational and the individual level. After setting the theoretical framework, this chapter presents six phases that describe a scale development process. The final scale consists of 14 items meeting standard quality requirements. The findings provide a valuable tool for future studies to explore relationships between ODRs and other aspects of organizational life.

4.1 Introduction: Measuring ODRs

Organizational routines facilitate coordination and work efficiency. Researchers have described routines as the building blocks of competitiveness, and the repository of organizational capabilities (Nelson and Winter, 1982; Becker et al., 2005). They are vital for all organizations to accomplish their tasks. Chapter 2 has indicated that routines exist at both the organizational and individual level and they are defined as

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[4] A paper based on this chapter has been accepted at the Academy of Management 2017 Annual Conference.

"a repetitive, recognizable pattern of interdependent actions, involving multiple actors" (Feldman & Pentland, 2003, p.96). Routine at the individual level is often associated with "habit" (Hodgson, 2008). Individual habitual behavior is defined as "a propensity to behave in a particular way in a particular class of situations" (Hodgson, 2008, p.16). Organizational routines emerge from individual habitual behavior, and reciprocally organizational routines give guidance on individual habitual behavior in organizations (Knudsen, 2008). Hence, both organizational routines and individual habits are repetitive responses to organizational realities reducing the cognitive load for employees. As a consequence, they provide shortcut solutions to recurring organizational problems (Knudsen, 2008).

However, routines have also been criticized as being inert, automatic and resistant to change (Feldman & Pentland, 2003; Gersick & Hackman, 1990). This is because individuals who perform routines feel secure in performing known daily tasks. Unknown and new routines make them feel anxious and insecure (Holmer, 2013). The fear of possible harmful effects and potential threats to individuals' or groups' interest caused by changes can elicit resistance and ODRs (Coghlan, 1993).

ODRs are elicited under conditions when they are most likely to be counterproductive to learning, and performance (Noonan, 2011) and are ubiquitous in all organizations regardless of their age, size and culture. However, so far research on ODRs remains in the static stage of replicating Argyris' early work. The latter is almost exclusively based on case studies and consulting. Although this has been extremely useful in isolating the characteristics of ODRs and defining their theoretical framework (see Chapter 2: Section 2.3.2), it lacks operationalization.

Frequently, organizations rely on external consultants to diagnose problems resulting from ODRs. However, when this happens, it may already be too late because the damage caused by ODRs may have gone too deep in the organization. As a result, the use of Argyris' prescriptions on ODRs has been limited. Yet, ODRs are well acknowledged by a number of academics as barriers to organizational learning (e.g. Easterby-Smith, Snell & Gherardi, 1998; Euchner, 2011; Sales, Vogt, Singer & Cooper, 2013; Tsang, 1997). For example, Sales et al. (2013) used a case study of a hospital to show how ODRs become prevalent in an organizational context discouraging people to speak up, resulting in incompetence disguise and, in turn, in putting patients' safety at risk.

If defensive routines are as pervasive as the existing qualitative studies suggest they are, then management in organizations would benefit from a tool that helps to recognize and isolate them more easily and in a timely fashion. Thus, the purpose of this chapter is to develop and test a scale to measure ODRs. The researcher claims such a measurement scale can be a tool enabling managers to identify the extent of ODRs present in their organizations. Hence, the following sections describe the development of the *Organizational Defensive Routines Scale*. The definition of ODRs includes organizational-level factors (e.g. policies) and individual-level factors (e.g. feeling of embarrassment and threat). Perceived ODRs at the organizational level serve as a context for ODRs which encourage individual level ODRs. Individual level ODRs feed back into ODRs at the organizational level and reinforce defensive behavior.

4.2 Theoretical Constituents of Organizational Defensive Routines

This section presents the conceptual framework under which ODRs are defined together with their constituencies at both organizational and individual levels. Though the definition of ODRs includes "actions" and "policies", and other researchers identified types of ODRs such as mixed messages, blaming others and protecting turf (Wilson, 2001), this study's aim is different as it needs to identify common themes of ODRs in order to develop a measurement scale.

4.2.1 ODRs: A theoretical framework of its constituents

Based on Feldman and Pentland's theoretical framework (see detail in Feldman and Pentland 2003) on routines, routines can be stable which mainly reflected on written procedures and intangible norms in organizations. This is coined as ostensive side of routines resulting in repetitive and recurrent patterns. This mainly reflected at organizational level of routines via tangible articulated standard operating procedure, or taken-for-granted norm. Referring to this level of ODRs, some written rules and procedures are so coercive (Adler & Borys, 1996) that they constitute organizational level defensive routines in themselves (Argyris, 1990). For example, some organizations require employees to follow written procedures conclusively in order to control employees' behavior and avoid being blamed if something goes wrong. These kinds of routines are tools for managers to maintain their power, but constrain employees' reaction on contingencies of work place. As a result, these routines nourish covert and inefficient behavior in organizations (Adler & Borys, 1996).

Simultaneously ODRs also trigger individual defensive behavior giving rise to individual level ODRs. This can be explained based on Feldman and Pentland's

theoretical understanding of organizational routines at their performative aspect. Individuals are the agency of performative behavior at routines and determines actions based on situations. Hence, this contributes understandings of routines at individual level.   Therefore, organizations and individuals would not encourage this kind of behavior deliberately although too many rigid rules and procedures are one symptom of ODRs (Ashforth & Lee, 1990). Most of the time people who contribute to ODRs are not aware of their counterproductive behavior (Tranfield et al., 2000). They think it is rational to avoid causing negative feelings to themselves or others. This insidious nature of ODRs makes them difficult to be detected. Different from general organizational routines which have tangible rules or archived procedures to trace back, ODRs exist in a more intangible mode, with individuals being unaware of their existence and persistently following what appears to be a tacit rule (Argyris, 1990).

Similar to general organizational routines, certain rules guide this routine behavior. According to Argyris (2001, p.94), the "rules" about designing and implementing mixed messages are: "1) Design a message that is inconsistent; 2) Act as if the message is not inconsistent; 3) Make the inconsistency in the message and the act that there is no inconsistency undiscussable; 4) Make the undiscussability of the undiscussable also undiscussable". These 'rules' show that designers and receivers of mixed messages cover up each other's feeling. This double cover-up reinforces each other's defensive behavior and creates an invisible and ritual organizational solution to embarrassment and threat.

The existing literature shows that ODRs are a highly powerful set of individual, and organizational phenomena that are connected and reinforce each other (Wilson, 2001; Argyris, 2006; Noonan 2007). More specifically, Argyris (1985) emphasizes individuals originate ODRs, however he also admits that it is organizational culture and system that reward and reinforce ODRs (Argyris, 1985). Hence, in this chapter, the researcher addresses these two dimensions of organizational defensive routines. The first dimension is about individuals' perception of how the organization operates. In particular, ODRs are triggered by procedures and practices that generate embarrassment, threat and confusion. At this first level of analysis, the researcher attempts to understand the organizational context via social interactions in organizations. Organizational context here means that it is independent from individual factors. The second level of analysis deals with the study of individual psycho-cognitive dispositions to react to embarrassment and threat in a working environment.

4.2.2 The two sides of organizational defensive routines

ODRs need interaction from both the organization and the individual to develop. The former provides the environment that is a vehicle for their diffusion and a repository. The latter offers the "raw materials" for routines to be understood and implemented. As the researcher has mentioned previously, ODRs have three loops from organizational level to individual level. The defensive loop in the lower level is nested in the higher levels (see Chapter 2).

4.2.3 Characterizing ODRs at the organizational level

The definition of ODRs clearly illustrated that "policy" is part of what contributes to create defensive routines. In an organizational environment, policies provide guidance for individual action, among other things. For this reason, organizational constituents of ODRs should include some elements that capture aspects of policy that may favor their emergence. One such thing is the density of rules and procedures. Argyris (1990) posited that too many rules and procedures are a symptom of ODRs. It is similar to red tape which exist as burdensome routines without effectiveness toward organizations' goals (Bozeman & Feeney, 2011). Actions organizations undertake to avoid embarrassment and threat are camouflaged to create an image of being competitive, especially at handling negative information. Those actions, for instance, bypass, easing in, face-saving, fancy footwork and self-censoring, are different in formats, but share the same purpose: avoidance of negative consequences by using ineffective or dysfunctional communication (Noonan, 2007). Three themes emerge from those avoidance actions from the

existing literature of ODRs: dysfunctional communication, risk aversion and conflict avoidance.

4.2.3.1 Dysfunctional communication.

From the definition of ODRs, "bypass" and "cover up" are identified as typical actions employees take to avoid embarrassment and threat. The way of creating avoidance is to give inconsistent, illogical and ambiguous messages (Noonan, 2007). Such messages are called mixed messages as Chapter 2 pointed out (Argyris, 1990). Valid information gets diluted or ignored during the flux of delivering mixed messages. Blames are shifted tactfully to somebody else. Dysfunctional communication in ODRs means employees self-censor their feedbacks or advocate their opinions without explaining and exposing their inferences. Dysfunctional communication is used to disguise employees' genuine thoughts which when being made public can make other people or themselves feel embarrassed. Hence, criticism is masked with ambiguity. In order to avoid threat and conflict, people in organizations adopt dysfunctional communication instead of open communication which allows for "varying perceptions and open discussions that challenge the viewpoints and traditional paradigms without threat, anger, resentments or retribution" (Ayoko & Pekerti, 2008, p.301). Consequently, such dysfunctional communication creates only a temporary solution to the problem, but the core underlying problems are hidden away. "The ability to get along with others is always an asset, right? Wrong. By adeptly avoiding conflict with coworkers, some executives eventually wreak organizational havoc" (Argyris,1986, p.74). Dysfunctional communication is ineffective, but employees who create this kind of

communication assume it is rational to adopt it in order to avoid conflict with authorities (Peng & Tjosvold, 2011).

As a consequence, ODRs make organizations places void of constructive dialogue for problem solving. Noonan (2007) reviewed a number of consultancy cases showing that employees are aware of some value destroying decisions made by managers in organizations. These cases showed that such lack of constructive dialogue leads individuals to refrain from voicing their true opinions as they could cause embarrassment to the managers or other colleagues, or they soften the extent of negative information resulting in misinterpretation and avoidance by receivers. In this context organizational climate plays a crucial role. For example, Morrison and Milliken (2000) posited that employees voice their opinion only if their opinion is expected to be valued, and only if there are no negative repercussions for speaking up. Otherwise, employees tend to either keep silent or use soft approaches to present their criticism in order to save their own face and others (Riley, Cudney & Long, 2013). They assume that their managers can guess what their thoughts are without challenging them personally. Simultaneously, some managers are also not open to discussing their mistakes, fears and doubt to avoid being recognized as incompetent (Argyris, 1986).

4.2.3.2 Risk aversion

Apart from dysfunctional communication, employees subject to ODRs also try to avoid taking risks. For example, they are reluctant to experiment novel ideas that might result in a failure. In organizations with defensive routines, failure is unlikely praised as a learning process, but rather considered an embarrassment for people

originating ideas. "Risk" is defined as "a characteristic of decisions that is the extent to which there is uncertainty about whether potentially significant and/or disappointing outcomes of decisions will be realized" (Sitkin & Pablo, 1992, p.10). "Risk aversion" in defensive routines means that organizations have a tendency of avoiding risk–taking in order to prevent potential negative outcomes such as embarrassment and threat. One example of risk aversion in defensive routines is that organizations allocate resources to stable and mature business divisions rather than giving equal attention to develop a new business area.

Individual attitudes towards risk are influenced by organizations' varying preference for uncertainty (Sitkin & Pablo, 1992). Organizations treating uncertainty as threat suppress employees' initiatives for proposing creative ideas and also restrict employees to simply follow rules and procedures. Managers also play an important role on decisions of avoiding or taking risks (Sitkin & Pablo, 1992). For example, when managers are afraid of negative feedbacks, they might end up encouraging silence from employees on organizational problems (Morrison & Milliken 2000). In this case, employees are not encouraged to speak up because of potential repercussions their behavior may cause. Therefore, those most averse to taking the risk to speak up would reinforce the mechanisms toward ODRs (e.g. Ashforth & Lee, 1990; Noonan, 2007; Tranfield et al., 2000). Therefore, it shows that there is some overlap between risk aversion and dysfunctional communication.

Tranfield et al. (2000) found that people in an organization with ODRs attempt to transfer responsibilities up or down hierarchies to avoid negative results. Some organizations may adopt rigid rules and procedures to prevent employees from taking risks to experiment with innovative methods of completing their task. In turn,

employees refer to the rules to avoid taking risks and responsibility. Hence, they discourage risk-taking which hinders change (Russ, 2012). Putnam (1993) also mentioned that people in organizations distance themselves from responsibilities and undesired results. People use 'ease-in' and 'play down' strategies to keep themselves from predicted awkward situations.

Additionally, executives and other managers need to monitor changing environments of their business operations which can be perceived as either threats or opportunities (Chattopadhyay et al., 2001). When they perceive the change as a threat, they tend to resort to internal directed actions to avoid possible risk of negative outcomes (Sitkin & Pablo, 1992). Thus, the perception on their organizations' interactions of handling risks and uncertainty reflects the extent of organizations' rigidity towards organizational changes.

4.2.3.3 Conflict avoidance

Conflict avoidance is found to be prevalent in organizations regardless of culture (Ting-Toomey et al., 1991; Tjosvold, 2008). Whether individuals decide to pursue or avoid conflict, depends on the gauged potential loss and gain from the conflict. The way people deal with conflict can take the form of avoiding disagreement (Ting-Toomey et al., 1991). Leung (1988) found that people tend to avoid conflict in an on-going relationship, because losses from a good relationship in the long term outweigh the gain from a conflict in the short term. Delivering negative feedbacks and criticisms may become a tricky issue to handle. Therefore, ambiguous sentences are used to soften issues. Alternatively, individuals may choose to keep silent and distance themselves from organizational problems. Noonan (2007) uses a case

showing conflict avoidance in a meeting: while two managers argued fiercely over an organizational problem on the stance of their own departments' interest, other members maintain silent and withdrew from the conflict. They are "playing safe" to protect themselves from risks of being criticized by choosing one side or the other. This conflict avoidance strategy leads to bad decision-making and it wastes time.

Conflict is "a class of face-threatening situations, demands active facework[5] management by both conflict parties" (Ting-Toomey et al., 1991, p. 280). Conflict, especially with authority, can put both parties under embarrassment. Though people from different cultures select different methods to manage conflict, avoiding disagreement could define ODRs. For example, in both cases there is an element of not raising genuine opinions in order to preserve face; this is an element of bypassing and easing-in uncomfortable information, or of censoring opinions (Riley et al., 2013).

In summary, dysfunctional communication, risk aversion and conflict avoidance have the potential to demonstrate that some organizations may have a culture to mask employee and management incompetence in order to avoid threat and embarrassment. A computer simulation study has shown how organizational culture and defensive routines are intertwined, and significantly affect individual decision making (Secchi & Bardone, 2013). Ashforth and Lee (1990, p. 631) suggest that "the organizational culture is a "meta-cause" of much defensive behavior. Specifically, the shared system of values, assumptions, and norms may well interact with individual characteristics and influence the tendency to avoid action, blames,

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[5] Facework here means strategies people use to mitigate face threatening or face losing.

and change, and this tendency may in turn reinforce the culture". If interactions in organizations show this tendency of encouraging employees to adopt dysfunctional communication, avoid risk and conflict, this will reinforce employees' psycho-cognitive disposition to employ routines to avoid embarrassment and change — i.e. ODRs.

The following section discusses the potential constituents of ODRs at the individual level such as embarrassment avoidance and resistance to change.

4.2.4 Constituents of ODRs at the individual level

Argyris focuses on micro-level defensive routines producing unintended consequences in organizations, especially at the managerial level (Bokeno, 2003). If managers' defensive routines are eliminated, employees are less vigilant regarding their fear of giving negative feedback. Another consequence of giving negative feedback may be alienation from the team (Argyris, 1993). This is because ODRs at an individual level are elicited in the interaction between employees, and between employees and management (Noonan, 2007). The literature (e.g. Ashforth & Lee, 1990; Holmer, 2013), emphasizes two characteristics of ODRs at the individual level: (1) resistance to change (RTC) and (2) embarrassment avoidance. Researchers posit that the main concern of people experiencing embarrassment is on what other people think of them, and whether their behavior is not what the others expect, according to social norms (Edelmann, 1985; Withers & Vernon, 2006). Additionally, it is contended that RTC happens during interactions between managers and employees (Ford et al., 2008; Thomas and Hardy, 2011).

4.2.4.1 Resistance to change

Researchers studying defensiveness posited that it is more prevalent when organizations face change, because individuals tend to resist change (Diamond, 1986). Organizational change creates uncertainties and stress for most employees, e.g. when jobs are at risk (Oreg, 2006). Individuals who are reluctant to change are more likely to cover up the information which may stimulate changes (Bovey & Hede, 2001). Employees showing high degrees of cognitive rigidity are unlikely to appreciate other employees' opinions and maintain the status quo (Friedman & Lipshitz, 1992). For the purpose of keeping themselves from the changes, they would become defensive towards learning and new routines. They do not have high initiative to seek new solutions to problems or voluntarily expose valuable information to push organizational changes forward. Giangreco and Peccei (2005) posited that people with high levels of resistance to change tend to hold information when facing uncertainty and therefore they are more likely to conceal their genuine opinions in an embarrassing and threatening situation. Although some researchers argue that resistance to change has a positive facet (e.g. Ford & Ford, 2010; Waddell & Sohal, 1998), RTC contributes to ODRs by maintaining old routines, withholding valuable information, and reluctant acceptance of new ideas.

4.2.4.2 Embarrassment avoidance

Another source of ODRs is embarrassment. It is conceptualized as "a self-presentational difficulty resulting from a concern with our observable behavior and a desire to conform and to please others" (Edelmann, 1985, p.1). This understanding of embarrassment aligns with Noonan's (2011, p.43) reasoning on the role of

embarrassment in ODRs – "The experience of embarrassment does not depend on whether or not I care about what others think of me. Instead, the awkwardness of embarrassment comes when others see or hear what I would have preferred they did not". Threat of embarrassment is the reason for causing ambiguity in a social relationship (Edelmann, 1985). This ambiguity is strategically adopted by people (Argyris, 1993). It reflects on mixed messages in ODRs sent by organizations or employees to "save face" by minimizing or explaining away the embarrassing behavior (Noonan, 2007). Therefore, people would censor their feelings and follow social rules such as being polite, respecting others' views, and avoiding making other people embarrassed (Riley et al., 2013). People performing defensive routines think they have been rational, as their motivation is to care and protect other people from embarrassment. One such example is that employees block or distort the unpleasant customers' feedback from senior managers in order to protect their immediate managers (Homburg & Furst, 2007). This behavior helps them avoid embarrassment for themselves and others, but thwarts organizational learning (Mazutis & Slaiwinski, 2008). Consequently, this embarrassment avoidance leads to self-reinforcing defensive routines which insulate peoples' assumptions from alternative outside views.

The two dimensions of ODRs discussed above reinforce each other and create an adverse force against revealing causes of embarrassment and threat within organizations. If organizations have intangible norms to encourage individuals to bypass embarrassment and threat by dysfunctional communication, risk aversion and conflict avoidance, people in organizations make the assumption that it is rational to filter valid information and soften negative messages. In turn, if individuals in

organizations have a desire to avoid embarrassment and are likely to resist change, then they tend to bypass or cover up problems in order to maintain the status quo. Due to this loop, it can be stated that defensive routines at the individual level are embedded at the organizational level, and defensive routines at organizational level create such a defensive working environment that makes individuals performing defensiveness think their behavior is rational.

To sum up the discussion from the previous sections, ODRs exist on both the individual and organizational level. First, at the organizational level the dimension of ODRs consist of *dysfunctional communication*, *risk avoidance*, and *conflict avoidance*. Second, two dimensions of ODRs exist at the individual level which are related to individuals' psycho-cognitive dispositions. These two dimensions of individual level ODRs are *embarrassment avoidance* and *resistance to change*. The next sections report the scale development process.

4.3 The Scale Development Process

Table 3 shows the steps followed to develop the scale presented in this chapter (DeVellis, 2012; Hinkin, 1998). DeVellis (2012) and Hinkin (1998) suggested a sequence of steps to follow for developing a measurement. This study adopted this process with six steps. The first four steps are mainly following the suggestions presented in DeVellis (2012). Then the researcher also followed Hinkin's (1998) suggestion and further conducted another two steps. The first step is to generate initial item pools and determine the format for measurement. The second step is to have subject experts review the items. This step results in eliminating some irrelevant and problematic items. The third step is to collect data to conduct a first

Exploratory Factor Analysis (EFA). The result of EFA leads to elimination of some items which do not load on the primary factors. The fourth step is to use Confirmatory Factor Analysis (CFA) for testing that the factors and items defined by the EFA are a good fit. The fifth step, the researcher collected another sample of data from the UK and carried out convergent, discriminant validity, and predictive test. In the final step, the researcher checked measurement invariance.

Table 3: Overview of the Scale Development Process

Study	Steps of scale development	Sample	Results
Phase 1	Development of a preliminary pool of items, starting from the definition and supplemented by a literature review	Discussion of retrieved items with 5 academics working in the area of organizational behavior and 4 managers working in industry.	Preliminary item pool (103 items) reduced to 40 items
Phase 2	Item generation and content validity	N= 9 experts in the field of organizational behavior, managers and administrators	Item pool defined and consisting of 30 items
Phase 3	Exploratory factor analysis (EFA), dimensionality and reliability	N=207 respondents from both public and private sectors (UK); 42% male; 64% public sector	Reduce items to 14 based on EFA
Phase 4	Confirmatory factor analysis (CFA);	N=288 respondents from both public and private sectors (UK); 52% male; Average age: 38.5. 78% full time employees; 30% worked more than 10 years. 43% public sector.	Further validate the scales extracted from EFA
Phase 5	Discriminant, convergent and predictive validity	N= 151 Respondents from variance industries. 52% men; 76% full time employees; 48% public sector; Mean of organizational tenure: 11 years.	ODRs scales further validated; ODRs discriminant from other similar concepts; ODRs predicts outcomes
Phase 6	Measurement equivalence	N= 150 employees (from United States); 53% men; 74% full time employees and, 41% public sector; Mean organizational tenure 11.5 years.	People from UK and USA interpret the scale in the same way.

This study measures ODRs via individual perceptions. It defines the individual factors contributing to ODRs, also identifies factors outside of individual actors at the organizational level. At the organizational level, the researcher identified "dysfunctional communication", "risk aversion" and "conflict avoidance" as three collective organizational phenomena. These three constructs explain why ODRs become prevalent in organizations. In contrast, "embarrassment avoidance" and "resistance to change" operate at the individual level reflecting the individuals' disposition towards ODRs. The organizational level here is measured from individual perceptions of routine interactions within the organization. It is common practice to use individuals' perception to measure organizational phenomena (e.g. Schnake and Dumler, 2003).

4.3.1 Phase 1: Item pool generation

An initial item pool of 103 items is derived mainly based on the interviews, case studies and theoretical papers found in the literature (e.g. Argyris, 1990; Ashforth & Lee, 1990; Noonan, 2007). An iterative process of discussing the items was carried out with a number of five experts in the field of organizational behavior. The researcher also consulted with four people who hold positions as managers and administrators in some of the local companies (UK). The definition of the construct and the constituents of ODRs are provided. After about 10 iterations to check for relevance, clarity and conciseness, performed by academics who are active in the field of organizational behavior, the number of items was reduced to 40. The deduction on the number of items mainly due to two following reasons. First, limited existing quantitative studies on ODRs could not provide clear understanding on

constituents of ODRs. Hence, the researcher came out with many similar items to represent the concepts. Additionally, the researcher's limited experience at the beginning of the research project in scale development is accounted for such a big drop at number of items. She designed many items with mixed perspectives from supervisors, colleagues and employees. This was confusing for readers. A seven-point Likert scale was adopted to rate each item to access content adequacy, leading to discard the items less relevant to ODRs. At the end of this process, each of the ODRs constituents has about eight items. Sample items include "My organization has an unspoken norm not to embarrass employees openly" for the dysfunctional communication factor; "Criticism in my organization is encouraged to be given in a subtle way" for the conflict avoidance factor; "I never dilute bad news to avoid embarrassment for myself or my colleagues" for the embarrassment avoidance factor; "I am open to challenges of my opinions from colleagues" for the resistance to change factor.

4.3.2 Phase 2: Item reduction

For the item generation and content validity step to be meaningful to the development of the scale, it is pivotal to select people who represent the main population of interest. The researcher's focus is on ODRs in the workplace. Hence, it is appropriate to aim at people who are currently working in organizations as our target participants. Nine people examined the initial item pool to identify ambiguous wording, double-barreled and redundant items. As a result, eight items were discarded and five items were reworded. The item pool is reduced to 30 (see

Appendix 1. All the items are formatted as 7-point Likert scales, which ranged from 1 (strongly disagree) to 7 (strongly agree). Some items are reverse coded.

4.3.3 Phase 3: Exploratory factor analysis

In order to perform the first statistical tests a survey is distributed using a traditional paper-and-pencil collection strategy and an online survey (using Qualtrics). A sample of 220 respondents took part in the study, but the final usable data were N=207. Respondents work in the private and public sector with a minimum of one-year work experience. Exploratory Factor Analysis (EFA) is adopted to identify the underlying constructs for ODRs.

EFA can be used to identify latent constructs underlying a set of manifest variables (Kim and Mueller, 1978; Norris and Lecavalier, 2010). In EFA, principal axis[6] factoring and direct oblimin rotation is employed for this study because it seeks the least number of factors and only considers common variance (Kim & Mueller, 1978). Prior to EFA, the researcher carried out analysis on correlation among the items. Any item that correlates less than .40 with all other items was eliminated from the analysis (Hinkin, 1998). Seven items were excluded as the result of the correlation analysis.

4.3.3.1 Findings

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[6] Despite the fact that EFA should be the technique for defining latent variables (DeVellis, 2012), a large number of studies have adopted PCA (Norris and Lecavalier, 2009) for psychological research. For comparison, PCA with promax rotation was conducted. The structure of factors is the same as the one from EFA.

After the researcher deleted items which did not load on factors with eigenvalue over one, the EFA from individuals' perception at the organizational level of ODRs results in two factors (Table 4). The latter result is slightly different from the theoretical model, that contained three factors (dysfunctional communication, risk aversion and conflict avoidance). However, the final scale results into two dimensions. The reason for this result is that the three factors share some common elements which already reflected in the literature. The two factors resulting of EFA represent the commonality of the three dimensions from different angles. For example, "my organization has too many rigid rules and regulations" and "playing it safe seems to be a common activity in my organization" are both about risk aversion. However, they are different in that the first item is about using authority to suppress the emerge of different opinions and the second item is about masking the capability via keeping status quo. The item, "The majority of our meetings last a long time and deal with trivial issues" is about conflict avoidance, and the item, "my organization gives mixed messages" is about dysfunctional communication. Nevertheless, these two items have a common element of covering up the underlying core issues by two seemingly different tactics. Hence, the researcher decided to label the factors differently. The first factor, named *organizational cover-up*, is composed of four items. It means *organizations cover-up* the existing organizational issues whose exposure could cause embarrassment or threat. The second factor named *organizational pretense* contains four items. *Organizational pretense* here means that organizations disguise themselves being competent by avoiding taking risk and suppressing employees to express different opinions. The first factor had eigenvalue 2.4, and the second factor had eigenvalue 1.6. They both together explain 52.29% variance of the common construct. The correlation of these two factors is 0.25.

Cronbach alpha for organizational cover-up is 0.72. Cronbach alpha for organizational pretense is 0.67. The cumulative Cronbach alpha for the organizational dimension of ODRs is 0.69, cumulative variance is 52.29%. This is slightly lower than the most referenced threshold 0.7.

At the individual level (Table 5), the researcher used principal axis factoring and direct oblique rotation for EFA. Based on theory, these two constituents of ODRs at individual level have clearly different dimensions. The eigenvalues from the scree plot match with the theoretical framework with 2.68 for the first factor and 1.30 for the second factor. After deleting nine items with the highly cross-loaded items and items had low factor loadings, this results in six items measuring ODRs at individual level. The first factor with three items reflects *rigidity at work* (RG) and represent a particular dimension of resistance to change (RTC) that suits ODRs. RG here represents individuals playing safe to avoid changes and showing insecure feelings under the support of organizational defensive context. RG does not measure personality, but a repetitive action employees and managers tend to resort to. After deleting the highly cross loaded items, the second factor contains three items reflecting *embarrassment avoidance*. This refers to individuals who avoid challenges from other people or challenges to other people in order to prevent embarrassment. Theoretically, these two factors should be correlated considering that one reason as of why people resist to changes is embarrassment prevention. The factor correlation matrix shows that the two factors are correlated by 0.40, which matches the theoretical inference. Additionally, Cronbach's alpha for RG is 0.66. Cronbach alpha for embarrassment avoidance is 0.80. The cumulative Cronbach alpha for individual dimension of ODRs is 0.74. Cumulative variance is 70.11%.

Table 4: Organizational Defensive Routine Factor Loading

(Organizational level)

	Factor	
	Organizational Cover-up	**Organizational pretense**
ODRs13: When things go wrong in my organization, nobody stands up to take responsibility.	0.79	
ODRs15: My organization gives mixed messages.	0.74	
ODRs14: My organization has too many rigid rules and regulations	0.54	
ODRs3: The majority of our meetings last a long time and deal with trivial issues	0.44	
ODRs7: Playing it safe seems to be a common activity in my organization		0.68
ODRs4: Most of my organization's decisions are not influenced by the discussion during meetings		0.59
ODRs1: Most of the time the major decisions in my organization are already made before a meeting actually takes place		0.53
ODRs9: Subtle and covert controlling actions are typically taken in my organization		0.47
Cumulative variance: 52.29%		
Cronbach alpha for Organizational cover-up: 0.72 Cronbach alpha for organizational pretense: 0.67		
Cumulative Cronbach alpha for ODRs: 0.69		

Note: n= 207. Principle Axis Factor and Oblimin rotation were used. Loadings lower than 0.40 were omitted.

Table 5: Organizational Defensive Routines Factor Loading (Individual level)

	Factor	
	Rigidity at work	**Embarrassment Avoidance**
RG4:I only change the way of doing things under pressure from the organization	0.85	
RG2:When dealing with work-related procedures and processes, I do not like changes	0.70	
RG3: In my job, I usually do not change the way I do things	0.65	
EMBA4: I feel embarrassed if my opinions are challenged by my colleagues		0.74
EMBA5: I feel embarrassed to challenge my superiors' opinions		0.71
EMBA3: I avoid speaking to the point if this would embarrass my colleagues		0.44
Cumulative variance: 70.11% Cronbach alpha for rigidity at work: 0.66 Cronbach alpha for embarrassment avoidance : 0.80		
Cumulative Cronbach's alpha is : 0.74		

Note: n= 207. Principle Axis Factor and Oblimin rotation were used. Loadings lower than 0.40 were omitted.

4.3.4 Phase 4: Confirmatory factor analysis

4.3.4.1 Methods

In order to validate the scale structure obtained from EFA, a Confirmatory Factor Analysis (CFA) is applied to a different sample with 288 usable responses. Data was collected by a US company specializing in survey research (Qualtrics) according to the demographics the researcher specified: UK workers from private, public and not-for-profit sectors. The data was subjected to a CFA which is used to assess its fit to the hypothesized factor structure (Kline, 1994). Maximum likelihood estimations

with SPSS-AMOS 23 are adopted to analyze data. Large samples could lead to high values of chi-square, which may suggest rejecting a model with a good fit. Therefore, χ^2 is adjusted by its degrees of freedom (df); χ^2/df should be in the range of 1.0 to 3.0 (Hu and Bentler, 1999). Sometimes it is also acceptable to have relative chi-square (X^2/df) less than 0.5 (e.g. Schumacker & Lomax, 2004; Wheaton, Muthen, Alwin & Summers, 1977). A mix of absolute and relative goodness-of-fit indexes is also adopted to assess the model fit including comparative fit index (CFI), the root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR) (Kline, 2005). Cut-off criteria for model fit indexes are as follows: CFI should be equal to or greater than .95; RMSEA should be equal or less than .08; SRMR should be equal to or less than .08 (e.g. Byrne, 2001; Hu & Bentler, 1999; Kline, 2005). The reliability of the final construct is measured by composite reliability (CR) and average variance extracted (AVE). Constructs with CR equal to or greater than .70 show there is high degree of internal consistency; AVE higher than or equal to .50 indicate the items can explain the latent construct at a satisfactory level (Hair, Black, Babin and Anderson, 2010).

4.3.4.1 Findings

EFA of ODRs at organizational level suggested a two sub-factor construct to measure ODRs. Results are χ^2/df =2.45; CFI=0.96, RMSEA=0.07; SRMR=0.05. These model fit indexes meet the most referenced cut-off criteria suggested by Hu and Bentler (1999) and Hair et al. (2010). Hence, the model suggested by EFA is confirmed by CFA (See Figure 3). That means the organizational dimension of ODRs can be measured by two sub-constructs, *organizational cover-up* and *organizational pretense*. AVE for *organizational cover-up* is 0.50 and AVE for *organizational pretense* is 0.51. The cumulative AVE: 0.50. CR for *organizational*

cover-up is 0.79 and it is 0.81 for *organizational pretense*. The cumulative CR for

ODRs at organizational level is 0.80.

Figure 3: CFA of Organizational defensive routines at Organizational Level
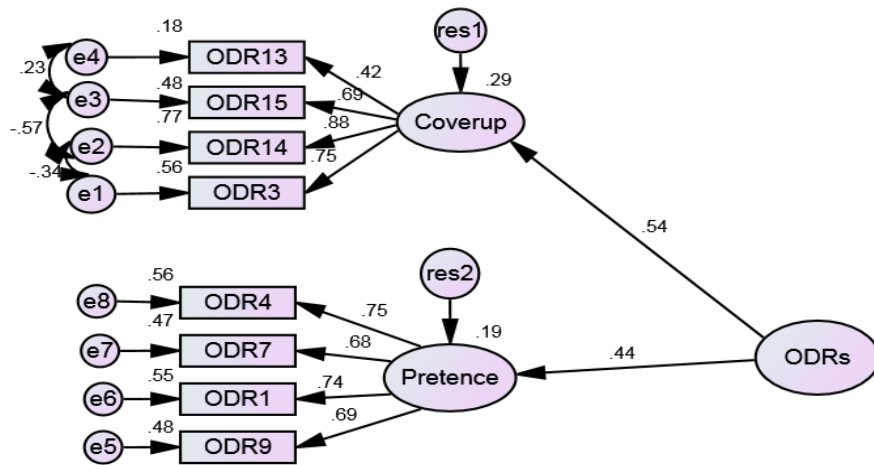
At the individual level, CFA is applied to analyze the model extracted from the EFA. CFA showed that $\chi^2/df = 3.68$; CFI=0.96; RMSEA=0.09 SRMR=.04. AVE for the factor rigidity is 0.49; AVE for embarrassment avoidance is 0.54. CR for rigidity is 0.74, and it is 0.78 for embarrassment avoidance. Though AVE for rigidity is minimally lower than the benchmark of 0.5, the researcher thinks this factor is still measuring ODRs, in consideration of its composite reliability. Hence, the factor is retained in the measurement. This result supports the model suggested by EFA in the first instance. The final scale for ODRs at individual level is six items (Figure 4).
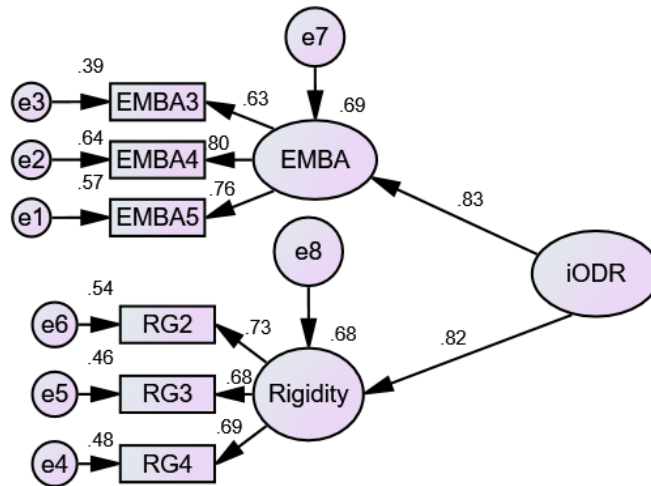
Note: EMBA= Embarrassment Avoidance; RG = Rigidity at work

4.3.5 Phase 5: Convergent, discriminant validity and predictive validity

Convergent validity assesses the degree to which the construct is similar to other constructs that are supposed to be highly correlated; discriminant validity is to show the construct is distinct from other constructs (Kline, 1993). Predictable validity (Criterion-related validity) is to examine 'relationship between the new measure and other variables which can be hypothesized to relate to develop a nomological network' (Hinkin, 1998, p.117).

For ODRs at the organizational level, the researcher expected ODRs are positively related to *organizational silence* and *red tape*. In this study, a sample of 150 UK employees from a variety of industries was used. Confirmatory factor analysis is used to test convergent and discriminant validity (Hair et al., 2010).

4.3.5.1 Organizational silence.

The literature review on ODRs at the organizational level reveals that organizational silence shares certain elements of ODRs. Most organizational silence focuses on employees' silence with problems in organizations (e.g. Pinder & Harlos, 2001; Vakola & Bouradas, 2005; Van Dyne, Ang, Botero & Dyne, 2003). Organizational silence is referred to as a collective phenomenon in organizations which treat the speaking-up of problems as a dangerous thing to do or as a waste of effort (Morrison & Milliken, 2000) and thus is a form of self-protection from external threats (Van Dyne et al., 2003) that encourages people to suppress their negative feedback (Morrison & Milliken 2000). While Morrison and Milliken (2000) discuss organizational silence, they applied ODRs to explain the reason why some managers avoid information which might cause embarrassment to them. Hence, this shows that

organizational silence shares certain elements of ODRs. Organizations with ODRs often have a norm which encourage individuals collectively adopting various methods, such as self-censoring and by passing problems, in organizations to avoid embarrassing themselves or others (Riley et al. 2013). The literature depicts that there are overlaps of these two concepts with the same element of covering up issues and is suitable to assess discriminant validity. However, organizational silence is mainly about employees' voice on organizational issues, but ODRs have more facets than voice measure. Therefore, the researcher predicts organizational silence will be related to but empirically distinct from ODRs. Organizational silence is measured by a subset of three items form Vakola and Bouradas (2005). The Cronbach alpha is 0.92.

4.3.5.1 Red tape

Red tape is conceptualized as "burdensome administrative rules and procedures that have negative effects on the organizations' effectiveness" (Bozeman & Feeney, 2011, p.84). Based on this definition, red tape can be perceived by individuals as burdensome rules and procedures without legitimate purpose (Kuafmann and Feeney, 2014). Hence, Red tape carries a negative connotation. It is inherently regarded being too slow to react to changes (Saldivar, 2015). Like ODRs which exist in organizations as a form of rules guiding people to avoid a candor discussion at negative organizational issues, and they are also barriers to organizations' effectiveness. Organizations with high ODRs tend to have more rules and regulations to restrict people' behavior. Individuals at organizations are also more likely to rely on those rules to protect themselves from any negative consequences (Argyris 2000). However, these two concepts are different. The manifestation of red tape is written

or articulated in organizations, which is explicit. Though too many rules and procedures are one manifestation of the ODRs, yet ODRs are often implicit. The researcher used two sub-scales of red tape measure from Bozeman and Feeney (2011). The Cronbach alpha is 0.94.

Table 6 shows that composite reliability of ODRs is greater than 0.7, therefore, the construct is reliable. For testing convergent and discriminant validity, the study followed Hair, Black, Babin, and Anderson's (2010) procedure. To demonstrate the discriminant validity and to show the distinction among ODRs, organizational silence and red tape, the researcher first checks if maximum shared variance (MSV) is less than AVE (Hair et al. 2010). The MSV for ODRs is 0.64, and the AVE for ODRs is 0.81. Second, average shared variance (ASV) should be less than AVE. The ASV for ODRs is 0.56, and the AVE is 0.81. Third, square root of AVE (on diagonals) are greater than inter-construct correlations (off diagonals) between ODRs and red tape $(0.90 > 0.70)$ and organizational silence $(0.90 > 0.80)$.

For convergent validity, AVE of ODRs (AVE $= 0.81$) should be larger than the threshold of 0.5. The correlation analysis among these three constructs shows that ODRs is significantly correlated with organizational silence $(r = 0.80; p < 0.01)$ and red tape $(r = 0.70; p < 0.01)$. In summary, this confirms that all the three constructs have good reliability, convergent validity and discriminant validity. The model also had good fit, which is shown in Figure 5.

Table 6: Factor Correlation Matrix with Square root of the AVE on the diagonal (organizational level)

	CR	AVE	MSV	ASV	ODR	Red tape	Orgsi
ODR	0.89	0.81	0.64	0.56	**0.90**		
Red tape	0.95	0.90	0.48	0.46	0.70	**0.95**	
Orgsi	0.92	0.71	0.64	0.53	0.80	0.66	**0.84**

Note: n=151,

1. Psy=psychological safety; ODRs= organizational defensive routines; Orgsi=organizational silence;
2. Square root of the AVE on the Diagonal
3. MSV= maximum shared variance; ASV= average shared variance

Figure 5:Structural Equation Modeling of Discriminant and Convergent Validity Test
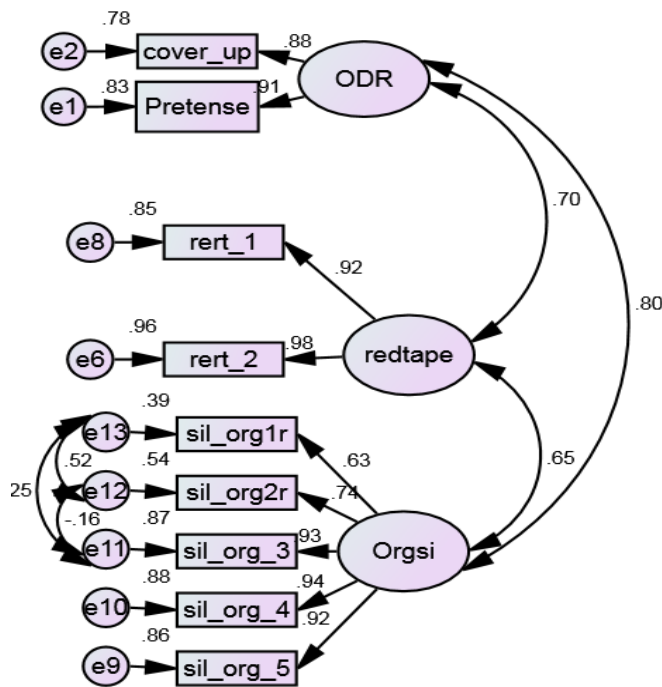
Note: rert= red tape; sil_org= organizational silence.

4.3.5.3 Employee silence and defensive silence

For ODRs at individual level, the researcher expects ODRs positively related to defensive silence and related to employee silence behavior, yet they should be empirically different. The researcher used the sample collected at the same time for testing discriminant and convergent validity of ODRs at the organizational level.

Individual defensive silence is measured by a subset of six items developed by Brinsfield, (2013). Its Cronbach alpha is 0.96. Employee silence behavior is measured by a subset of three items from Vakola and Bouradas (2005). Its Cronbach alpha is 0.94. These two constructs are used to test discriminant validity (see Table 7). CR of ODR is 0.81 which is larger than 0.7. Thus, it tells that the construct of ODR is reliable. The discriminant validity was assessed using three criteria, first MSV <AVE (0.41< 0.68); second, ASV < AVE (0.37 < 0.68); third, square root of the AVE should be larger than inter-construct correlation between ODRs and employee silence behavior (0.82> 0.58) and defensive silence (0.82 > 0.64).

For convergent validity (see table 7), AVE of ODR is 0.68 which is higher than the threshold of 0.5 (Hair et al. 2010). The correlation analysis among the three variables shows that ODRs is significantly correlated with individual defensive silence ($r = 0.64$, $p < 0.01$) and employees silence behavior ($r = 0.58$, $p < 0.01$). Taken together, ODRs at individual level have good reliability, discriminant and convergent validity. The model also had good model fit, which shows at Figure 6.

Table 7: Factor Correlation Matrix with Square Root of the AVE on the Diagonal (Individual Level)

	CR	AVE	MSV	ASV	ODR_i	Defensive Silence	Silence Behavior
ODR_i	0.81	0.68	0.41	0.37	**0.82**		
Defensive Silence	0.96	0.81	0.41	0.34	0.64	**0.90**	
Silence Behavior	0.95	0.85	0.34	0.31	0.58	0.52	**0.92**

Note: n=151,

1.ODR_i= organizational defensive routines at individual level

2. Square root of the AVE on the Diagonal

3. MSV= maximum shared variance; ASV= average shared variance

Figure 6: Structural equation modeling for discriminant and convergent validity test at individual level.
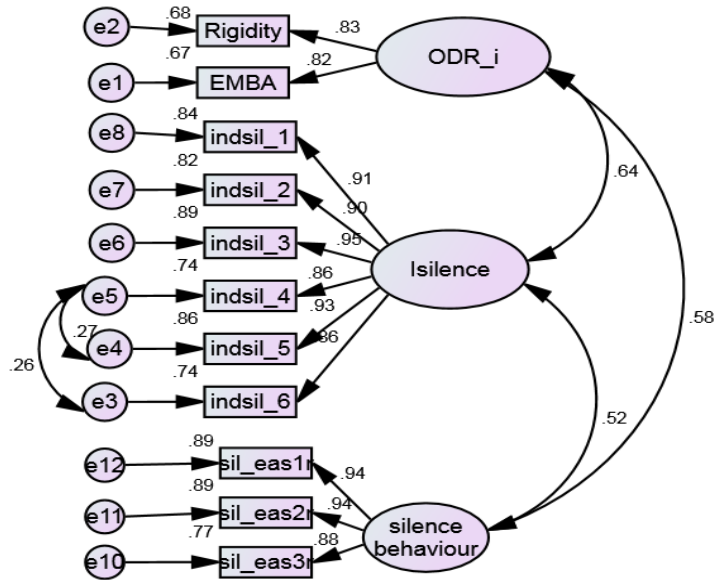
Note: indsil = Individual defensive silence; sil_eas = employee silence

Finally, the researcher addressed the predictive validity of ODR. At organizational level, psychological safety is used as an outcome variable. Edmondson (1999) proposed that psychological safety is a shared belief in a team that members feel safe to take interpersonal risk to share critical issues in organizations. If ODRs exist in organizations, people tend to feel insecure to discuss negative issues with their colleagues. This is because they will be perceived as "trouble makers". The researcher stipulates that ODRs have negative effect on psychological safety. The researcher used four items from the scale developed by Baer and Frese (2003) to measure psychological safety at organizational level. The Cronbach alpha is 0.85. The correlation analysis shows that ODRs is negative and significant related to psychological safety ($r = -0.58$, $p < 0.01$). Moreover, Table 8 shows that ODRs still negatively predict psychological safety ($\beta = -0.55$, $p < 0.01$). Hence, the findings support ODRs at organizational level have predictive validity.

Table 8: Regression analysis of ODRs on psychological safety

DV= Psychological Safety	Step 1		Step 2	
	β value	p value	β value	p value
Constant	4.51	0.00**	6.82	0.00**
Gender	0.34	0.14	0.22	0.24
Tenure	0.01	0.50	0.04	0.66
Employ Status	-0.22	0.41	-0.27	0.23
Sector	0.39	0.06	0.15	0.37
OrgODRs			-0.55	0.00**
Adjusted R^2	0.01		0.35	
F	F(4), 1.47; $p = 0.21$		F (5), 15.57; $p < 0.001$	

Note: n = 151. OrgODR= organizational defensive routines at organizational level;
** $p < 0.01$; * $p < 0.05$

At the individual level, the researcher uses *job satisfaction* to assess predictive validity of ODRs. Previous studies have found that employees' silence is negatively related to job satisfaction (Vakola & Bouradas, 2005; Knoll & van Dick, 2013). Thus, the researcher predicts that ODRs would negatively related to job satisfaction. Job satisfaction is measured by one item. Using single-item measures of job satisfaction is an acceptable practice (Wanous, Reichers & Hudy, 1997). Here the researcher uses a global measure of job satisfaction that is a standard on large scale panel datasets, such as the British Household Survey Panel. The item asks respondents "overall, how satisfied or unsatisfied are you with your current job". The correlation analysis shows that ODRs is negatively and significantly correlated with job satisfaction ($r = -0.35$, $p < 0.01$). Furthermore, after controlling gender, tenure and employ status and sector, ODRs still negatively predict job satisfaction ($\beta = -0.49$, $p < 0.01$) (see table 9). therefore, the findings show that ODRs at individual level has predictive validity.

Overall, empirically studies support the predictive validity of organizational defensive routines at both organizational level and individual level.

Table 9: Regression Analysis of ODRs on Job Satisfaction at Individual Level

DV=job satisfaction	Step 1		Step 2	
	β value	P value	β value	p value
Constant	4.27	0.00**	5.90	0.00**
Gender	-0.36	0.24	-0.25	0.39
Tenure	0.01	0.62	0.00	0.98
Employ Status	0.45	0.22	0.60	0.08
Sector	0.26	0.36	0.27	0.31
iODR			-0.49	0.00**
Adjusted R^2	0.02		0.15	
F	F(4), 1.47; p=0.53		F (5), 4.96; p < 0.001	

Note: n = 151. iODR= organizational defensive routines at individual level; ** *p< 0.01*

4.3.6 Phase 6: Cross-cultural measurement equivalence of ODRs

It is important to establish measurement invariance in order to have meaningful interpretations of research across groups. Measurement equivalence means that different groups (e.g. gender, culture and ethnicity) ascribe the same meanings to the construct (Byrne et al., 2009; Milfont & Fischer, 2010).

Cultural differences often contribute to measurement nonequivalence and make the comparison between different cultural groups meaningless (Byrne et al., 2009). For example, people in the UK tend to be less confrontational and emotionally unexpressive than their American counterparts (Meyer, 2015). In other words, they are more likely to avoid discussing issues which could cause embarrassment. This study endeavors to examine invariance of ODRs measurement across British and American contexts. Though the culture difference between UK and US cultural

context is not extremely distinct, but empirically it is found that these two cultures are still different (Robert & Hanges, 2004). Two primary levels of potential invariance are examined in this study: configural and metric (Milfont & Fischer, 2010; Vandenberg & Lance, 2000).

To assess measurement invariance across UK, the data for conducting discriminant and convergent validity is used. For the American sample, the researcher entrusted Qualtrics, a research company, to send the survey to potential participants. The usable American sample is 150. The descriptive information about the sample is presented in Table3.

Configural invariance is the first step to establish measurement invariance. If the same pattern of constrained and free elements in the construct can be held across groups, configural invariance is supported (Widaman & Reise, 1997). In the current study, configural invariance would confirm that the latent constructs associated with the concept of ODRs (the first order constructs and the second-order latent construct) were similarly reflected in both cultures because manifest items would load on the latent variables as hypothesized. Metric invariance confirms that the strengths of the relationship between specific items and their underlying construct are similar across groups (Milfont & Fischer, 2010). Multi-group CFA techniques are often applied to perform measurement invariance (e.g. Byrne &Watkins, 2003; Cheung & Rensvold, 2002).

Following the steps suggest by Widaman & Reise (1997) and Vandenberg & Lance (2000), an analysis of configural invariance is carried out across two cultures. The

second order hierarchical factor structures for ODRs are specified and tested respectively. At the organizational level, the fitness indexes for both the UK sample (X^2 = 29.19; df = 14; CFI = 0.97; RMSEA = 0.08; SRMR = 0.04) and the USA sample (X^2 = 19.50; df = 14; CFI = 0.99; RMSEA = 0.05; SRMR = 0.03) all meet the minimum criteria for the model fit (Hu and Bentler, 1999; Hair et al., 2010). At the individual level, the fitness indexes for both the UK sample (X^2 = 2.01; df = 8; CFI = 0.99; RMSEA = 0.01; SRMR = 0.01) and the USA sample (X^2 = 5.31; df = 7; CFI = 0.99; RMSEA = 0.01; SRMR = 0.03) are also higher than the minimum requirements for model fit indexes. Overall, the form of the latent construct of ODRs at both organizational level and individual level seemed to hold across two cultures.

Then, two-group CFAs to examine the measurement invariance for configural invariance is carried out. At the organizational level, the result for this analysis is shown in model 1 of table 10 and confirmed as an acceptable fit (X^2 = 58.7; df = 32; CFI = 0.98; RMSEA = 0.05; TLI = 0.96; SRMR = 0.04). At the individual level, the result in Model 1 of Table 11 also showed a good model fit (X^2 = 22.1; df = 16; CFI = 0.99; RMSEA = 0.04; TLI = 0.98; SRMR = 0.01). Hence, the second-order factor structure for ODRs at both the organizational and the individual level holds across the UK and US contexts.

After testing configural invariance, the analysis for metric invariance is examined by constraining all the factor loadings to be the same across groups (Milfont & Fischer, 2010). At the organizational level, results shown in Model 2 of Table 10 demonstrate that constraining invariance across groups model fix indexes did not change much ($\Delta\chi^2$ = 10.4; df = 8) and p > 0.05. At individual level, the model fit

showing at model 2 of Table 11 also did not vary significantly $((\Delta\chi^2 = 2.6; df = 6)$ and $p > 0.05$. Thus, the loading values of all items at both organizational and individual level were invariant across these two samples.

Table 10:Summary of Fit Statistic for Testing Measurement Invariance of ODRs at Organizational Level Across UK and the United States

Model	X^2	df	X^2/df	CFI	RMSEA	SRMR	Model comparison	ΔX^2	df	p-value	Invariant?
Model 1: Configural Invariance	58.7	32	1.83	0.98	0.05	0.04					
Model2: Metric Invariance	69.1	40	1.73	0.98	0.05	0.05	2 vs. 1	10.4	8	0.24	Yes

Note: n (UK)= 151; n (USA) = 150

$\Delta X2$: change in X^2 is based on the difference between a model in which factor loadings are constrained to be equal in both survey waves with one in which they are free to vary.

Table 11: Summary of Fit Statistic for Testing Measurement Invariance of ODRs at Individual Level Across UK and the United States

Model	X^2	df	X^2/df	CFI	RMSEA	SRMR	Model comparison	X^2	df	p-value	Invariant?
Model 1: configural invariance	22.1	16	1.38	0.99	0.04	0.01					
Model2: Metric invariance	24.7	22	1.12	0.99	0.02	0.02	2 vs. 1	2.6	6	0.86	Yes

Note: n (Uk)= 151; n (USA) = 150

ΔX^2: change in X^2 is based on the difference between a model in which factor loadings are constrained to be equal in both survey waves with one in which they are free to vary.

4.4 Discussion

Most studies on ODRs are based on consultancy experience (e.g. Argyris, 1990; Noonan, 2007). The prevalence of ODRs in organizations and the damage ODRs can cause to organizations have been well acknowledged and accepted by academics. However, there is lack of measurement of ODRs for organizations and academics to identify this negative behavior. To fill this theoretical gap, the researcher identified a theoretical structure from literature, which includes dysfunctional communication, risk aversion and conflict avoidance at organizational level, and embarrassment avoidance and resistance to change at individual level. Furthermore, through a series of quantitative studies, three theoretical components at organizational level merged into two sub-constructs of ODRs with eight items, namely *organizational cover-up* and *organizational pretense*. Although Cronbach's alpha for *organizational pretense* is 0.67 which is slightly lower than the often referenced benchmark 0.7, but its 95% confidence interval included .70. This may be acceptable for the early stage of instrument development (Nunnally, 1978; DeVellis, 2012). This is often seen in the newly developed scale (e.g. Flores, Zheng, Rau & Thomas, 2012; Putz, Schilling, Kluge & Stangenberg, 2012). Additionally, the newly developed scale has been confirmed by both EFA and CFA. This gives enough confidence to support the scale's internal consistency.

At the individual level, two theoretical components remain separated with six items. Resistance to change is renamed into rigidity at work to be more relevant to ODRs. The study also established the initial reliability and validity of the constructs. Using data collected in the UK and USA, the measurement invariance is confirmed.

Argyris focused on ODRs at individual level and posited that ODRs often starts from individuals (1990). This study identified two dimensions of ODRs at individual level, namely embarrassment avoidance and resistance to change. Both EFA and CFA confirmed the two sub-construct measure. Overall, it can be concluded that ODRs are multi-dimensional.

4.5 Implications

This study makes four important contributions to the ODRs field. First, to the researcher's knowledge, there are no other studies that identify the components of ODRs at both the organizational and the individual level. Most of the studies on ODRs focus on demonstrating the consequences of having ODRs in organizations. There is no clear and systematic identification on components of ODRs. By proposing theoretical models of ODRs at both levels, this study enriches organizational routine theories. This study shows that organizational routines are repetitive actions individuals interact with other members at an organizational setting. These actions are affected by both individuals' cognition and social environment at organizations. The study also indicates that not all the routines are building blocks of organizational capabilities. Instead, they can be impediment of organizational progress.

As far as the researcher's knowledge is concerned, this is the first time that a rigorous process is followed to develop a scale measurement for ODRs. The study also attempts to make the theoretical argument on ODRs more convincing to organizations by highlighting the multi-dimensional nature of ODRs. The multi-dimensional nature of ODRs shows that eliminating ODRs requires organizations'

effort on changing their defensive working climate. It also demands all the employees to reduce their own defensiveness on self-censoring important information without worrying about repercussions. If organizations only focus on one of the dimensions, it will not be sufficient to reduce ODRs.

Second, Argyris (2001) theoretically proposed that ODRs exist in all cultures, but this claim is not tested empirically. Configural invariance test have been confirmed the hierarchical second-order structure of ODRs in both UK and US cultural context. It made the researcher believe that ODRs could be measured from two dimensions at organizational and individual level independently. Though the differences between UK and USA cultures are not as significant as comparing western cultures and Asian cultures, yet this is first step to establish whether culture affects peoples' interpretation on the scale. It provides a new reliable and valid scale for identifying ODRs across cultures, which enriches the existing ODRs theories and extends the applicability of the scale for empirical studies.

Additionally, the study contributes to bringing in a new perspective to understand the reason why organizational routines are inert and automatic. Although Feldman (2000) suggested that organizational routines are the source of stability and change, ODRs make organizations a place of preferring to maintain old routines, at most, temporary changes (Argyris, 1990). Hence, the inert nature of routines becomes more apparent in organizations with ODRs than without ODRs. Routines are carried out by a system of individuals who interactively work together, so an emergence of new routines requires to solve conflicts between individuals before reaching a new truce (Nelson & Winter, 1990; Cacciatori, 2012). When ODRs are prevalent in

organizations, the dominant way of solving conflict is bypassing and covering up organizational issues (Noonan, 2000). Without a clear communication on the issues, the intermediaries are not able to transfer the correct intention of one actor to another resulting in maintaining old routines (Bapuji et al., 2012). Additionally, organizations with ODRs tend to encourage people to exploit incumbent routines and avoid exploring new routines, because a new routine is exposed to more risk of resistance and criticism than an unknown routine (Argyris, 1990). This results in organizations investing more on an exploitation process instead of an exploration process (Gilbert, 2005). Altogether, it means that the existence of ODRs could contribute to the limited dynamic of organizational capability to change at macro-level of organizational routines.

The study also brings individuals psycho-cognitive tendency into consideration of micro level of organizational routines. Routines at individual levels are understood from individuals' actions in organizations (Cohen, 2012) together with materials such as computers and technological tools (Pentland et al., 2012). Organizational routines involve multiple actors whose actions are interdependent (Feldman, 2000). Hence, it is essential to have shared cognitive frameworks among these actors in order to reduce the cognitive distance between them (Witt, 2011). While ODRs exist in organizations, individuals are prone to make assumptions on the rationality of disguising their candor opinion toward negative issues (Noonan, 2011). The unexposed cognition framework on the causes of embarrassment and threat in organizations increased the cognitive distance between employees. As a result, the opportunity of designing new routines for solving the negative issues would not be identified and the old routines stay effective. This reflects Simon's (1974) theory

that individuals' cognition is at the top of the pyramid to determine individuals' habitual behavior and emotion. It also brings a novel perspective on how individuals can contribute to the emergence of new routines by reducing ODRs.

The researcher also would like to note the practical implication of this study. First, the scales can serve as diagnostic tools for consultants and organizations to identify ODRs. Measuring ODRs is valuable for organizations to identify ODRs at any stage of their development, especially when organizations are going through changes (Argyris, 1990). At the individual level, it is important for individuals as well to be aware of their own contribution to ODRs, as ODRs relate to their own job performance. Additionally, regular assessment of ODRs at both the organizational and the individual level could contribute to the assessment of whether organizations have formed a culture unconsciously to encourage employees to by-pass or cover up negative issues. This could create barriers for organizational learning. As Tranfield et al. (2000) pointed out organizations who want to be learning organizations need to reduce or eliminate ODRs in order to unlearn old routines. Furthermore, the ODRs instrument can be used as a tool for consultants to define ODRs at the early stage of examining organizational problems or confirming their findings from case studies. Previous case studies conducted by Argyris (1990) and Noonan (2007) showed that identifying ODRs is time consuming. These instruments could be beneficial for them to recognize ODRs more efficiently.

Secondly, from the societal perspective, the results of this study can facilitate people to have a different perspective on understanding certain social virtues such as suppress negative feelings and respect other people in order to avoid embarrassment

and conflict (Argyris, 2001). Those social virtues simply confine people to have open discussion on negative issues (Noonan, 2007). However, this study shows that constructively revealing genuine feelings toward negative issues can enable people to identify the causes of the embarrassment and threat at the first place, so that the problems can be solved at the initial stage. Changing peoples' perspectives on social virtues related to dealing with embarrassment and threat will benefit organizations to have a healthy environment to decrease ODRs.

4.6 Limitation and Outline of Future Research Recommendations

Nonetheless, the study also is inevitable to have some limitations. First, focus groups are an alternative way to generate items in the initial stage of scale development. As the use of focus groups is a good method to generate rich information and assess initial ideas about items (Kline, 1993). This might have limited the researcher's understanding of the concept. Learning from this, the researcher can match focus group with expert panels in a future study. However, this study added an iteration of consulting with people from both academic and practical fields. The advice received from these groups could have increase the robustness of item generation.

Second, the studies for item generation and validation were conducted to avoid common method bias. However, the researcher tested predictive validity using a sample collected from the same respondents. This could cause a problem of common method variance (Podsakoff et al., 2003). This method bias should not affect the validity of the new scale measuring ODRs, but their predictive validity. A future study should retest the predictive validity.

Third, this study only used psychological safety as a criterion variable at organizational level. Future studies could include some other important outcome variables, such as organizational communication. Job satisfaction is the only criterion variable at individual level. Future studies could other organizational concepts such as job performance and trust.

Future work could further test the measurement this study developed in an Asian cultural setting. Though this study tested measurement invariance between UK and USA, these two cultures of these two countries are not very distinct. Tsang (1997) postulates that ODRs could be more prevalent in Chinese organizations than they are in western ones, because the Chinese culture does not encourage individuals in organizations to criticize other people openly, especially to managers. Chinese people are more likely to avoid confrontation and expressing their own feelings in comparison with people from UK (Meyer, 2015). Thus, it would be interesting to see if the measure presented here is reliable in a Chinese context.

Another suggestion for future research is to apply the scale to test some theoretical ideas about ODRs and other organizational variables such as organizational learning. It is well acknowledged by researchers that ODRs hinder organizational learning (e.g. Argyris, 2001; Easterby-Smith et al., 2004; Tranfield et al., 2000). This is because ODRs constitute an impediment to valid information (Miner and Mezias, 1996). However, very few studies have been conducted to test this theoretical argument empirically due to a lack of valid measurement for ODRs. Thus, the

measure presented in this chapter provides a tool that enables applied empirical research. Furthermore, except that future research can test the immediate relationship between ODRs and other organizational variables, studies can also identify other potential mediating or moderating roles ODRs play.

4.7 Conclusions

As future research recommendation outlines, there is a need to expand the current understanding of ODRs. This newly developed scale of ODRs provides the researcher an opportunity to empirically test the theoretically proposed relationships in Chapter 2 via two empirical studies. One tests the effect of ODRs on relationship between organizational characteristics and organizational learning and is presented in the next chapter. The other tests the effect of ODRs on the relationship between individuals' personality traits and organizational learning and is presented in Chapter 6.

CHAPTER FIVE: ODRs , Organizational Factor and Organizational Learning[7]

Previous chapters have already pointed out that organizational learning is fundamentally important for organizations to stay competitive in the current dynamic environment. However, organizations regardless age, size and structure often failed to reach their learning goals. The literature reviewed in Chapter 2 shows that ODRs could be one reason to explain this outcome. The researcher applies the newly developed scale of ODRs in this chapter to test whether organizational level ODRs moderate the relationship between organizational characteristics such as size, age and structure and organizational learning.

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[7] A paper based on this chapter has been presented at the Academy of Management 2016 Annual Conference.

5.1 Introduction

As already noted in Chapter 2, organizational learning has attracted abundant interests from academics and practitioners (e.g. Argote & Miron-Spektor, 2011; Cohen, 1991; Easterby-Smith, Snell & Gherardi, 1998). However, most studies on organizational learning focus on conceptualizing learning and defining components of organizational learning (e.g. Huber, 1991; March, 1991; Miner and Mezias, 1996). Researchers approached learning from different disciplines (Easterby-Smith et al., 1998) (see Chapter 2, p.40). The core of most definitions is that learning can elicit potential change in cognition and behavior (e.g. Argote & Miron-Spektor, 2011; Huber, 1991). However, identifying the determinants of organizational learning (Martínez-León & Martínez-García, 2011) has been neglected even though some of their effects have been theoretically isolated. Chapter 2 has posited that organizational structures seem to play a crucial role in shaping organizational learning. Nevertheless, very limited empirical research has been carried out to explore this important theoretical insight.

Additionally, size and age are also assumed to be important determinants of organizational learning. Organizational size reflects organizational resources in that larger firms tend to dispose of wider cash flows, better trained human resources, and can afford to take more risks than small firms (Rogers, 2004). These resources could facilitate learning. Organizational age reflects experience and this is the foundation of learning (Levitt and March, 1988). However, existing research on organizational age and size failed to produce consistent results as to whether age and size have negative or positive effects on organizational functioning (e.g. Camisón-Zornoza, Lapiedra-Alcamí, Segarra-Ciprés, & Boronat-Navarro, 2004; Rogers, 2004; Sorensen & Stuart, 2000). Empirically identifying the relationships between these

variables (structure, size and age) and organizational learning can shed light on how managers can enhance their organization's learning capabilities.

As Chapter 2 suggests, ODRs are one reason why some organizations fail to learn despite having appropriate structures and resources, the researcher would like now to reflect again on some characteristics of ODRs so that the effect of ODRs can be better understood. ODRs distort the validity of information and cover up issues resulting in anti-learning attitudes (Wilson, 2001). Research suggests that learning depends on the level of ODRs (Noonan, 2007). When ODRs are strong, people in organizations tend to maintain a status quo and avoid taking risks to change their current way of work (Argyris, 1990). This bypassing and avoidable routine behavior constitutes an obstacle to organizational learning.

The purpose of this study is to test the relationships between organizational learning and organizational structure, age and size under the presence of ODRs. Drawing on the theoretical effect of ODRs, the researcher argues that ODRs have a negative impact in moderating the relationship between organizational learning and the aforementioned organizational factors (i.e. structure, age and size).

The study in this chapter makes three contributions to the literature. First, the researcher extends the literature on ODRs. This study produces new empirical evidence which helps us to refine and challenge current thinking on ODRs and organizational learning. This study considers ODRs as a potential moderator which brings organizational factors such as structure, size and age into the discussion. Second, the results have implications for practitioners who wish to enhance the learning capabilities of their organizations. Most importantly, organizations need to have a culture that encourages people to openly discuss negative issues to avoid

embarrassment and threat. Finally, to the researcher's knowledge, no previous study has simultaneously examined the relationship of organizational size, age and structure and ODRs in the context of organizational learning.

5.2 Literature Review and Hypotheses

This section develops hypotheses on the relationships between variables, which Chapter 2 has theoretically proposed. Certain points made earlier in Chapter 2 are raised again for two reasons. First, these arguments are the ground from which more refined arguments can be built in relation to the dimensions of the ODRs scale. Second, it helps to increase the readability of this specific chapter.

5.2.1 Organizational learning

Chapter 2 outlined the meaning of organizational learning, the three perspectives of organizational learning and the levels of organizational learning. This chapter adopts a traditional cognitive perspective which treats organizational learning as an information process and helps with the operationalization of the concept.

The diverse ways of interpreting organizational learning creates a challenge to generalize the results and select the "appropriate" method - qualitative, quantitative, or both - that the study should adopt in studying organizational learning (Miner & Mezias, 1996). Over the past decade, one of the models that has been empirically tested frequently is Huber's (1991) perspective (e.g. Jiménez-Jiménez & Sanz-Valle, 2011; Pérez López, Peón, & Ordás, 2005; Pérez López, Peón, & Ordás, 2004). The model also maintains a broad view of organizational learning that is capable of capturing the multifaceted characteristics and inter-linked processes across levels. Huber (1991) approaches learning from a cognitive perspective and suggests that an organization learns "through its processing of information" and, for this reason, "the

range of its potential behaviors has changed" (Huber, 1991, p.89). Huber perceived organizational learning as an information generating process that happens among individuals, groups and organizations as a whole. Four components are used to describe the learning process: *knowledge acquisition, information distribution, information interpretation and organizational memory*.

Knowledge acquisition is the first step towards organizational learning. In order to serve organizational development needs knowledge needs to be acquired. Sources of knowledge can come from inside and outside the organization. For example, internally, some of the knowledge is inherited from those already working in the organization at the time of the assessment. Additionally, some knowledge can be created by research and development and some knowledge is accumulated from experience during the organizational production process (Huber, 1991). One example for gaining knowledge externally is to hire new employees with the knowledge in demand. Knowledge can also be acquired through mergers and acquisitions. More recent views on learning based on cognition consider these clear-cut distinctions is challenging to divide when explaining how knowledge works in practice (Clark, 2008). In fact, any distinction between internal and external is arbitrary and the knowledge acquisition process is more a cognitive exchange where internal and external resources 'interplay' (e.g. Clark & Chalmers, 1998). Despite the way 'acquisition' is intended, this aspect can be considered a key of learning.

Information distribution concerns how to spread information among individuals and departments in organizations. *Information distribution* leads to "more broadly based organizational learning" (Huber, 1991, p. 101). Good information dissemination

among departments helps organizational members to understand needs of other departments (Huber, 1991). It also improves organizational efficiency when projects require coordination among multiple departments (Hansen, 2002). Tacit and explicit knowledge has been reviewed extensively in the literature of knowledge management (Matzler et al., 2011a). Explicit knowledge is about rules and procedures that can be documented in organizations to guide employees' behavior. This kind of knowledge is easily replicated and distributed in organizations. However, according to the proponents of this approach, the majority of the organizations' knowledge is 'stored' in individuals' heads and it is tacit (Kim, 1993). Tacit knowledge is challenging for organizations because it is difficult to locate its source and to initiate knowledge sharing. This is because, in a very traditional view based on neoclassic economics, people who share knowledge could face the risk of losing their competitive advantage over other people (Borges, 2013). Instead, a more prosocial view of individual knowledge sharing can be based on a more distributed or systemic view of cognition (e.g. Hutchins, 1995). Individuals in an organization share 'information' because they treat each other and the external artifacts as external cognitive resources (Hutchins, 1995). This leads them to behave prosocially when leaning on each other's information; in short cooperation and altruistic behavior are more likely to emerge (Secchi, 2011) provided the appropriate cognitive abilities develop (Hutchins, 2014).

Information interpretation concerns people in organizations giving one or more commonly understood meanings to information. Reaching a certain extent of common interpretation on information is necessary for organizations to make the right strategic decisions (Sinkula, Baker, & Noordewier, 1997) and achieve efficient

cooperation between departments (Huber, 1991). Knowledge interpretation mostly depends on a series of factors in between organizational and individual characteristics. An example of how interpretation of ideas, thinking, behavior, practices, processes or anything else occurs is given by studies of intra-organizational diffusion processes. These studies point out how organizational routines, culture, peer social identity, individual attitudes and cognition are particularly relevant for information interpretation to emerge (e.g. Abrahamson & Rosenkopf, 1997; Fiol & O'Connor, 2003; Secchi & Gullekson, 2015).

Organizational memory is about retaining information in organizations in forms of standard operating procedures, structural artefacts and mental models (Walsh & Ungson, 1991). Not all memory is explicit; instead, some memory is covert, tacit, and difficult to observe (Becker, 2004). This nature of being unobservable creates difficulties to interpret information (Sinkula et al., 1997). The effect of organizational memory can be understood from two dimensions. On the one hand, it increases organizational efficiency by automatically retrieving past successful experience and conducting behavior repetitively when a known situation triggers a standard response. Routines as organizational memory have been studied substantially and are credited as a source of stability and change (e.g. Nelson & Winter, 1982; Feldman, 2000; Feldman and Pentland, 2008). On the other hand, organizational memories are often 'condemned' as being an enemy to organizational development, especially when routines become incompatible with a changed environment (Walsh & Ungson, 1991) or like organizational defensive routines, become regular behavior to avoid organizational issues which may elicit embarrassment and threat. This avoidance behavior is considered to have negative

effects on organizational learning (Argyirs, 1990).

5.2.2 Integrating ODRs at organizational level and individual level

Though Chapter 2 has discussed the characteristics of ODRs, this section highlights some of these characteristics again in order to remind the logic of these hypotheses. This section also explains how ODRs at individual level integrate to ODRs at organizational level and how ODRs at these two levels reinforce each other.

Chapter 2 have comprehensively generalized the determinant elements of ODRs from four facets including social influences at young age, organizational context, individuals' tolerance on embarrassment and individuals' cognitive rigidity. All of these elements together indicate that ODRs are a product of individuals and organizations. Individuals in organizations mindlessly follow four governing principles (see Chapter 2, p. 35) and automatically adopt skills to avoid embarrassment and threat. As a result, individuals' defensive routines become prevalent resulting in organizational defensive routines (Riley & Cudney, 2015). Therefore, Argyris, (1996) argued that individual defensiveness is the origin of ODRs, but ODRs are like a fertilizer nurturing individual defensiveness and making it more acceptable in organizations.

Employees' assumptions on managers are shaped by the organizational culture, or their assumptions are a generalization from their previous experience in the organization. Their defensiveness is not accounted for individual's personality, but a symptom of regular solutions to handle negative issues. For example, researchers found that fewer than 15% of executives appreciate receiving contradictory advice (Taylor & Bright, 2011). Other executives are more likely to become defensive

towards negative feedback. Management's unwillingness to open communication about negative issues encourages employees to cover up their genuine opinions about the causes of the issues since raising negative issues to managers could cause embarrassment to them or be a threat to their position in the company. Hence, both managers and employees lose opportunities to discuss solutions to deal with the issues in time. This double-bound between managers and employees creates a self-reinforcing loop suppressing communication either top-down or bottom-up, enabling cover-ups, conflict avoidance, and embarrassment-free climates. Consequently, organizations with defensive routines are like a beautiful apple with rotten parts growing inside – problems aggravate without notice.

5.2.3 Organizational structure

Centralization refers to whether the locus of decision making power is dispersed throughout the organization or limited to the top management team (Dalton and Tudor, 1980). Chapter 2 mostly discussed the relationship between centralization and organizational learning from a perspective of employees' involvement in decision-making. This section focuses more on how centralization affects some components of organizational learning, such as knowledge sharing and knowledge acquisition. Organizations with a less centralized structure instill more social interaction resulting in higher levels of knowledge sharing (Chen & Huang, 2007). Bisel, Messersmith, and Kelley (2012) argued that command structures in organizations could cause incompetent communication between supervisors and subordinates resulting in organizational ignorance on organizational problems. Frost, Osterloh, and Weibel (2010) used the example of American Airlines dealing with flight delays to illustrate that organizational hierarchical control creates a 'culture of fear.' This results in individuals in organizations directing blame to other

people instead of learning from failures. Therefore, too much control caused by centralized organizational decision making can negatively affect knowledge sharing of organizational learning. Additionally, high centralization can force decisions into actions by bureaucratic power. This reduces employees' motivation to interact with other people and rationalize decisions through discussion (Miller, 1987).

In contrast, decentralization encourages coordination among team members, when decisions have to be made by persuading other members to understand the logic of ideas instead of passively transfer ideas down. Low centralization results in better information sharing and communication (Willem & Buelens, 2009). With wide resources of information and diverse views on problems, organizations can minimize irrationality of decision-making and enlarge the possibility of identifying core errors. Willem and Buelens (2009) found that decentralization is significantly and positively related to knowledge sharing.

High centralization gives executives a lot of power to rights and authority of decision-making. This can widen the social distance between executives and regular employees. As regular employees' task is to execute the decisions instead of participating in decision-making, valid information that employees collect from work processes might be missed result in poor knowledge acquisition of organizational learning. Consequently, organizations miss learning opportunities. Hence, high centralization is often negatively related to organizational performance, knowledge management, and innovation both theoretically and empirically (Damanpour, 1991; Pertusa-Ortega, Zaragoza-Sáez, & Claver-Cortés, 2010). Hence, the researcher hypothesizes:

Hypothesis 1a: *A centralized organizational structure is negatively related to organizational learning.*

Centralized organizational structures do not encourage interactions between supervisors and their subordinates (Damanpour, 1991). Therefore, subordinates tend not to share their opinions on problem solving. This structure would make employees assume that opposing ideas are not welcomed, and they will be treated as "evil" among the group if they put unconventional ideas forward. Without open discussion of the problem, organizations cannot develop a realistic and implementable learning plan. Organizations with decentralized structures are more likely to have better communication toward problems than command structure. Top management teams can examine problems taking holistic perspectives via effective discussion with other members, which results in identifying the root causes and develops fundamental systemic solutions to changes (Beer & Eisenstat, 1996; Siggelkow & Levinthal, 2005). If ODRs exist in centralized organizations, they would aggravate the already limited information flow between different hierarchical levels. If ODRs emerge in decentralized organizations, they would interfere with the healthy feedback channel. This is because ODRs have the feature of giving mixed messages. When this happens, more useful information will take more time to emerge from the deceived conversation between members.

Hypothesis 1b: *Organizational defensive routines moderate the negative relation between organizational learning and centralized organizational structure, such that the relationship is stronger when organizations have high organizational defensive routines.*

Formalization. Chapter 2 mostly focuses on the effect of rigid rules and routines on organizational learning. This section discusses how formalization affects four components of organizational learning such as knowledge creation and knowledge sharing. Low formalization gives employees' flexibility to experiment with new ways of completing tasks instead of following rules (Damanpour, 1991). Testing alternative ways provides more opportunities to identify errors in old rules or procedures. Consequently, low formalization benefits knowledge creation (Wang & Ahmed, 2003). High formalization reinforces routine behavior by established organizational rules. This could diminish the employees' drive to initiate new knowledge or to share information (Fredrickson, 1986). Under highly-formalized structures, changes will most likely be minor adjustments around existing rules (Fredrickson, 1986). If organizations are in a turbulent market, quick and effective interdepartmental communication with a flexible and less formalized structure is more suitable (Burns & Stalker, 1961). It reinforces established knowledge in organizations but also restricts people creating knowledge which is crucial for organizational learning (Willem & Buelens, 2009). Therefore, formalization has been empirically and theoretically argued to be negatively related to knowledge management (Chen & Huang, 2006). This negative relation hinders the development of organizational learning (Martínez-León & Martínez-García, 2011). However, certain advantages of formalization should not be neglected. For example, it can be assimilated to routines and serve as reservoir of organizational knowledge (i.e., memory; Feldman & Pentland, 2003). To some extent, formalization provides sources of basic learning in organizations. Nonetheless, rules and procedures tend to become obsolete over time due to the constantly changing environment. Thus, the researcher hypothesizes:

Hypothesis 2a*: A formalized structure in organizations is negatively related to organizational learning.*

Whilst organizational defensive routines are prevalent in most organizations, people prone to rigidly follow rules and procedures in order to avoid being blamed for mistakes (Ashforth & Lee, 1990). Rule designers in organizations with ODRs also prefer to compose red-tape to serve their own interest in order to stay in control (Argyris, 1990). This will strengthen the negative effect of formalization on organizational learning, as people in formalized organizations restrict their behavior to rules and procedures rather than flexibly adjusting their behavior in accordance to situational needs. Thus the researcher hypothesizes:

Hypothesis2b: *Organizational defensive routines moderate the negative relation between organizational learning and formalized organizational structure such that the relationship is stronger when organizations have high organizational defensive routines.*

5.2.4 Size effects

The importance of organizational size for organizational learning can be understood from two perspectives. The first perspective is that size is closely related to organizational routines, and these (organizational memory) are part of organizational learning (Pérez López et al. 2004). According to Mintzberg (1983), employees' behavior in large organizations is guided by more rules and procedures than small organizations. Therefore, large organizations are good at storing and institutionalizing knowledge through rules and procedures. However, Chapter two indicated that large organizations also tend to have more red tapes and rigid structures which could impede organizations making changes.

The second perspective is from a resource point of view which has been lightly discussed in Chapter 2. Here the researcher expands the discussion about the effect of size on organizational learning. Large organizations normally have more disposable resources to facilitate the development of new ideas than small organizations (Hurley & Hult, 1998). The advantage of possessing ample resources benefits large organizations when recruiting well-trained employees with the specific knowledge and skills organizations need for new knowledge development. Additionally, large investments in advanced technologies facilitate learning (Damanpour, 1992). However, it is worth noting that small organizations normally employ flat structures that create better environments for informal communication and shared experiences (Mintzberg, 1983). Since small organizations have the flexibility to adapt; this flexibility also gives larger leeway of maneuvering so that change and learning can occur. Instead, large organizations, with their set of rules and bureaucracy also can learn, but their learning is more institutionalized and more likely to be relatively minor. So, the line of argument is that SMEs are good at non-repetitive and change-based learning while large firms are good at routine-based learning. The former is more apparent than the latter because it happens outside of organizational structures; it is more likely to be unexpected. Hence the researcher hypothesizes:

Hypothesis 3a*: Size is negatively related to organizational learning.*

Companies being small have advantages in conducting informal communication and dispersing knowledge efficiently, but the existence of organizational defensive routines makes people feel uncomfortable at discussing negative information (Yau & Cheng, 2011). Negative information is often dispersed in an ambiguous way in order to avoid conflict with people who are involved. Hence, organizational defensive

routines weaken the advantage small organizations have over large organizations when communication is considered. When defensive routines exist in large organizations, people tend to maintain a status quo instead of making use of abundant resources to explore learning opportunities. This is because learning is a process of identifying and correcting errors. Organizations with defensive routines tend to have less error tolerant cultures and make people believe finding errors in the work could embarrass other people. Hence, the researcher hypothesizes:

Hypothesis 3b: *Organizational defensive routines moderate the negative relation between organizational learning and size, such that the relationship is stronger when organizations have high organizational defensive routines.*

5.2.4 Age effects

Chapter 2 has argued that there might be an effect of age on organizational learning. Starting from there this section refines the argument in a way that enables the researcher to derive a clear cut hypothesis. Old organizations surviving from long time competition in the market have accumulated vast previous experiences to face volatile markets. The same reason that confers competitive advantage for old organization can instill organizational inertia and impede organizational learning. Experience is coded into organizational routines and becomes a part of organizational repertoire (Cohen, 1991). Stored experience becomes automatic and a mindless reaction to familiar situational stimuli. This results in employees trying to improve their efficiency in dealing with similar problems, but fails in recognizing an already changed environment (Gersick & Hackman, 1990). Successful experience emerges from failures and investment, so it is a cost for organizations to abandon

already well-established routines to experiment with uncertain solutions. Employees also feel psychologically insecure towards new routines, because "novelty can lead to anxiety and loss of security" (Feldman & Pentland, 2003, p. 98). It might be more challenging for people in old organizations to change their behavior radically.

Hypothesis 4a. *The age of organizations is negatively related to organizational learning*

One advantage of being an old organization is having more experience to deal with unpredictable situations (Thornhill & Amit, 2003). However, experience needs to be adjusted to suit current situations. If organizational defensive routines exist in old organizations, questioning the old successful experience could be perceived as a danger which causes embarrassment to people who generalized the experience. Because of the fear of challenging the old way of doing things, individuals tend to stay in their comfort-zone and cover up information which could trigger changes. Hence the researcher stipulates a hypothesis:

Hypothesis 4b: *Organizational defensive routines moderate the relation between age of organizations and organizational learning, increasing the negative impact that the former has on the latter.*

5.3 Method

5.3.1 Data and sample

The researcher combined the survey for scale development of ODRs with the survey of testing hypotheses. The total number of respondents is 440 employees working in the UK from a broad variety of industries. All respondents have been working with their employer for more than one year. This was required because

people with less than one-year experience may not be familiar with organizational learning strategies. The restriction on respondents' tenure improves the validity of information in the data.

The study adopts two methods recommended by Podsakoff et al. (2003) to reduce common method bias. First, the order of questions is randomized through the settings of the survey software. Second, the items measuring dependent variables are placed at a different page from items measuring independent variables. This could reduce priming effect. Additionally, researcher adopted Harman's method of testing common method bias by forcing all the predictors and outcome variables to load on one factor (Harman, 1967). The result shows that one factor only explains 26.31% of total variance (64.19). Statistically this suggests that common method bias is not a concern for the study.

After deleting unengaged respondents and outliers, the usable data contains $N = 358$ observations. The study had slightly more male respondents than female (51.4% vs. 48.6%). The majority of respondents work full time (79%). 41.3% of respondents work in the public sector, and 52% of them work in the private sector. Only 6.7% of them work in non-profit sector. The average age was 38, and its standard deviation is 11.66. Missing values only take 0.18% of our data and they did not display a systematic pattern. Hence the researcher imputed the data and replaced the missing values with mean of the respective variables. (means for the different variables are: ODR14 = 4.5; EMBA 5 = 3.7; RG 4 = 3.8; KA 3 = 4.7; OM 2= 4.9; Centralization 1 = 4.7.)

5.3.2 Measures

5.3.2.1 Dependent variables

Organizational learning. There are very few available scales for measuring organizational learning. This study used the scale developed by Pérez López et al. (2004) and applied by Jiménez-Jiménez and Sanz-Valle (2011) and Pérez López, Manuel Montes Peón, and José Vazquez Ordás (2005). Thirteen items measure organizational learning on a 7-point point scale. Three items each for knowledge acquisition, knowledge distribution and knowledge interpretation. Four items are for *organizational memory*. The overall scale has a reliability of alpha = 0.91. *Knowledge acquisition* is measured by three items *Knowledge distribution* is measured by three items, knowledge interpretation, organizational memory is measured by four items.

5.3.2.2 Independent variables

Organizational structure. Centralization and formalization are measured by Ferrell and Skinner's (1988) scale. Participants indicate their perceptions on a 7-point scale. The higher the value selected, the more their organizations are centralized or formalized. Centralization is measured by five items with Cronbach alpha of 0.88. Formalization is originally measured by six items, but the scale for this study results in a very low Cronbach alpha. After deleting the items contributing to low reliability, the scale is reduced to two items with Cronbach alpha 0.63. While this is not an ideal measure, low alphas appear to be common with the formalization scale (see John, 1984). Thus, the researcher decided to take the measure forward to the analyses. "Many major decision that I make has to have this company's approval" and "my dealings with this company, even quite small matters have to be referred to

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someone higher up for a final answer" are representative items for centralization. "There are many things in my business that are not covered by some formal procedure for doing it" and "I ignore the rules and reach informal agreements to handle some situations" are representative items for formalization.

Organizational age. The number of years since organizations are in operation is often used to measure organizational age (e.g. Sorensen & Stuart, 2000). Respondents indicated the age of their organizations from six groups, namely 0-1; 2-5; 6-10; 11-20; 21-50 and more than 50.

Organizational size. The number of employees in organizations is often used to measure organizational size (Camisón-Zornoza et al., 2004). The researcher used the following answer options for size: up to 10 (micro company, coded '1'); 11-50 (small company, '2'); 51-500 (Medium company, '3') and more than 500 (large company, '4'). A preliminary analysis showed no significant difference in treating this variable as a continuum or categorical. Hence, the researcher here treats the variables as categorical variable and creates dummy variables.

Organizational defensive routines the researcher used the scale developed in Chapter 4. The construct is measured by two sub-factors. First, *organizational cover-up* measured with four items (Cronbach alpha=0.76) and second, *organizational pretense* measured with four items (Cronbach alpha=0.80). Cronbach alpha for the aggregated organizational defensive routines scale is 0.76. Exam items are "when things go wrong in my organization, nobody stands up to take responsibility" for measuring *organizational cover-up*; and the item "most of the time the major decisions in my organization are already made before a meeting actually takes place" measuring *organizational pretense*.

5.3.2.3 Control variables

Previous studies show that job level, job status and organizational tenure could affect people's perception of organizational learning (Yau & Cheng, 2010). Therefore, this study controlled for these variables using a dummy variable for job status (1 = full-time). Additionally, categorical indicators were used for job level (1 = general employees; 2 = supervisory; 3 = middle manager; 4 = senior manager; 5 = executive), and tenure (1= less than a year; 2 = 1-2 years; 3 = 3-5 years; 4 = 6-10 years; 5 = 11-15 years; 6 = 16-20 years; 7 = more than 20 years). Ultimately the researcher controlled for sector affiliation, i.e., public, private and non-profit.

5.4 Results

5.4.1 Descriptive statistics

Table 12 displays the means, standard deviations, and correlations of the variables. According to these results centralization is strongly, negatively correlated with formalization (r = -0.62, p < 0.01). Formalization is negatively correlated with organizational learning (r = -0.23, p < 0.01). Organizational defensive routines are negatively associated with organizational learning (r = -0.39, p < 0.01). Organizational defensive routines are positively correlated with centralization (r =0.41, p < 0.01), but negatively correlated with formalization (r =-0.23, p < 0.01). Organizational age and size are not correlated with organizational learning, but they are negatively correlated with organizational defensive routines, young organization (r =-0.14, p < 0.01) and SME (r =-0.21, p < 0.01)

Table 12: Means, standard deviations, and correlations (N=358)

	Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10
1	OL	4.68	1.04	**0.91**									
2	Centralization	4.15	1.38	0.05	**0.88**								
3	Formalization	3.44	1.3	-0.23**	-0.62**	**0.63**							
4	ODRs	3.99	0.93	-0.39**	0.41**	-0.23**	**0.76**						
5	Young_OG	0.37	0.48	-0.01	-0.1	0.1	-0.14**						
6	Small_OG	0.57	0.5	-0.08	-0.31**	0.33**	-0.21**	0.30**					
7	Full time	0.79	0.41	0.04	0.05	-0.02	0.01	0	-0.01				
8	Tenure	0.44	0.5	-0.06	0.04	-0.01	-0.01	0.32**	0.18**	-0.09			
9	Public	0.41	0.49	0.03	0.1	-0.16**	0.11*	-0.05	-0.18**	-0.05	0.06		
10	not for profit	0.07	0.25	0.08	-0.04	0.04	-0.01	-0.07	0.05	-0.08	0.05	-0.23**	
11	general staff	0.5	0.5	-0.04	0.16**	-0.05	0.11*	-0.06	-0.14**	-0.18**	0.06	0.1	0

Note: *p<0.05 **p<0.01; N=358 (two-tailed test); ODRs= Organizational defensive routines; OL= Organizational learning.

1.Firm age (<21 years) is coded as "1" ; others are coded as "0". 2 Firm Size (<500) is coded as "1"; others are coded as "0". 3 Full time is coded as "1"; others are coded as "0". 4 Tenure (2-5) is coded as "1"; others are coded as "0". 5 Private companies are coded as "0". 6 Supervisors is coded "1", others are coded as "0"; Cronbach alpha for the variables are in diagonal.

5.4.2 Organizational defensive routines and organizational learning

Table 12 shows that ODRs are negatively and significantly related to organizational learning ($r = -0.39$, $p < 0.01$). This provides preliminary support for the claim that ODRs are detrimental to learning. A correlation analysis also reveals the association between ODRs and sub-factors of organizational learning. ODRs are negatively and significantly associated with the four sub-factors: knowledge acquisition ($r = -0.38$, $p <0.01$), knowledge distribution ($r = -0.21$, $p <0.01$), knowledge interpretation ($r = -0.47$, $p <0.01$), organizational memory ($r =-0.31$, $p <0.01$). Among these four sub-factors, ODRs have the highest correlation with knowledge interpretation.

5.4.3 Testing the hypotheses

The researcher used multiple regression analysis to examine the relationships between variables. ODRs and variables for centralization and formalization are centered. The researcher uses VIF to check for multicollinearity. VIF measures the extent to which collinearity among the predictors affects the precision of a regression model. The literature suggested that VIF scores less than 10 are considered acceptable (Hair et al. 2010, Field 2013). The average VIF of this study is 1.85 and the single highest VIF is 2.64. Therefore, the study does not have multicollinearity issues.

Table 13 displays the main results. Model 1 includes all the control variables. The result shows that none of the control variables has a statistically significant influence on organizational learning and, in fact, the regression model shows a poor fit. The result shows that most of the control variables has no statistically significant influence on organizational learning apart from not for profit organizations ($p < 0.1$). and, in fact, the regression model shows a poor fit. One possible reason why employees with part-time or full-time have no different impact on organizational learning is that organizations may provide the same learning opportunities to both groups, such as training and sharing information. In terms of tenure, the sample only included employees who have been working in their current organizations more than one year. This restriction at sampling was to improve reliability of respondents' knowledge at organizational learning. However, employees after a year working at organizations tend to be assimilated with organizational culture and get familiar with organizational routine practice. This may contribute to the result that tenure did not have significant influence on organizational learning. Regarding to job positons, as

most senior managers at the sample from organizations with less than 50 employees. Due to the small size of organizations, information can be easier to equal dissimilated in organizations compared with larger organizations. Model 2 adds the core predictors (centralization, formalization, firm size and age). Results show that centralization (β = -0.11, p = 0.03) and formalization (β= -0.26, p < 0.001) negatively and significantly predict organizational learning. These findings support Hypothesis 1a and Hypothesis 2a. Organizational age and size do not have a statistical effect on organizational learning leading us to reject Hypothesis 3a and Hypothesis 4a.

Model 3 adds ODRs. The result shows that formalization remains negatively and significantly associated with organizational learning, but centralization (β = 0.05, p = 0.18) becomes non-significant toward organizational learning. Model 3 also reveals that ODRs have a negative and significant direct relation with organizational learning (β = -0.66, p <0.001). The adjusted R^2 increases from 0.06 in model 2 to 0.13 in model 3. The F-value also increases from 3.52 to 6.62, which shows that goodness of fit of these two models is statistically significant. Hence, ODRs make the largest contribution to predicting organizational learning compared to other variables in the model. Organizational age and size remain non-significant.

Model 4 investigates whether the association between the main predictors (centralization, formalization, age, and size) and organizational learning depends on the extent of organizational defensive routines. Aguinis's (2004) method of analyzing moderation effect is adopted in this study. The study dichotomized organizational defensive routines and defined the upper 25% of their values as high level. The researcher centered centralization and formalization. Then the researcher

computed ODRs-by-centralization, ODRs-by-formalization, ODRs-by-organizational size and ODRs-by-organizational age are added as new variables in Model 4.   The results of Model 4 indicate that ODRs moderate the relationship between formalization and organizational learning, with β = -0.24, p=0.03. R^2 slightly increases to 0.18 from 0.16. Therefore, Hypothesis 2b is supported, but 1b, 3b and 4b are not supported in this study.

Figure 7 displays the simple slopes for the relationship between formalization and organizational learning at low levels and high levels of ODRs. The slope shows that when defensive routines are high, organization learning declines.

Table 13: Multiple regression analysis (N=358)

DV=OL	Model 1			Model 2			Model 3			Model 4		
	Coeff.	Std.Error	p	Coeff.	Std.Error	p	Coeff.	Std.Error	p	Coeff.	Std.Error	p
(Constant)	4.61	0.16	0.00**	5.99	0.38	0.00**	6.05	0.37	0.00**	5.62	0.44	0.00**
Full time	0.11	0.14	0.42	0.11	0.13	0.43	0.07	0.13	0.58	0.1	0.13	0.44
Tenure	-0.12	0.11	0.28	-0.13	0.12	0.26	-0.16	0.11	0.16	-0.15	0.11	0.17
Not for profit	0.42	0.23	0.07*	0.42	0.22	0.06	0.5	0.21	0.02	0.53	0.22	0.02
Public	0.13	0.12	0.27	0.05	0.12	0.68	0.08	0.11	0.46	0.1	0.11	0.37
General staff	-0.08	0.11	0.5	-0.06	0.11	0.61	-0.06	0.11	0.61	-0.04	0.11	0.74
Firm Age				0.08	0.12	0.5	0.03	0.12	0.79	0.01	0.13	0.96
Firm Size				-0.06	0.12	0.61	-0.07	0.12	0.55	-0.05	0.14	0.7
Centralization				-0.11	0.05	0.03*	-0.07	0.05	0.18	-0.04	0.06	0.5
Formalization				-0.26	0.05	0.00*	-0.26	0.05	0.00**	-0.18	0.06	0.00**
ODR							-0.66	0.12	0.00**	0.24	0.76	0.75
ODR*centralization										-0.03	0.12	0.77
ODR *formalization										-0.24	0.11	0.03*
ODR *firm age										0.1	0.27	0.71
ODR *firm size										-0.02	0.26	0.96
R^2		0.02			0.06			0.16			0.18	
Adjusted R^2		0			0.06			0.13			0.14	
F		F(5), 1.17; p=0.33			F(9), 3.52; p<0.001			F(10), 6.62; p<0.001			F(14), 5.20; p<0.001	

1.Note: *p<0.05; **P<0.01; DV: Organizational Learning; Control variables: Firm age (<21 years) is coded as "1"; others are coded as "0". Firm Size (<500) is

coded as "1"; others are coded as "0". Full time is coded as "1"; others are coded as "0". Tenure (2-5) is coded as "1"; others are coded as "0". Private companies are coded as "0". General staff is coded "1", others are coded as

Figure 7: Regression slopes for organizational defensive routines
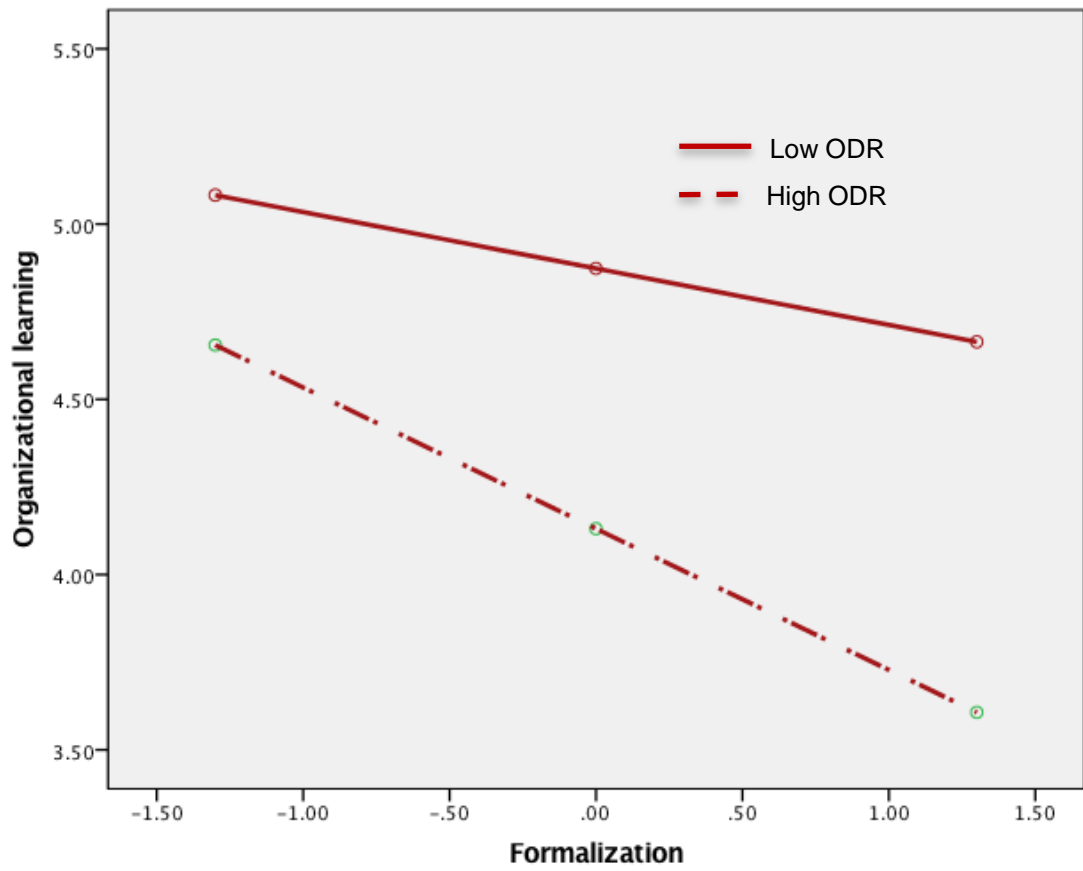
5.5 Discussion, Implication and Conclusion

This section provides discuss of the findings and implications to academics and practitioners while a more general discussion appears in Chapter 7. It ends with concluding remarks.

5.5.1 Discussion

One purpose of the study is to test the moderating effect of ODRs on the relationship between organizational factors (centralization, formalization, size and age) and organizational learning. The results of the data analyses only show that ODRs negatively moderate the relationship between formalization and organizational learning.

First, the existing literature on defensive routines posited that they are a barrier to organizational learning (e.g. Noonan, 2007; Tranfield et al., 2000). However, this proposition is rarely tested empirically. The results show that ODRs are negatively associated with organizational learning. This finding is consistent with the current literature, and it empirically confirms that defensive routines are a barrier for organizational learning.

Second, the findings of this study also show that ODRs are negatively correlated with all the four sub-factors of organizational learning. This means that their existence reduces employees' desire for knowledge acquisition and distribution. People in an organization with high levels of defensive routines are likely to maintain the status quo in order to avoid risks. Hence, they tend to advocate their own opinion rather than acquiring new ideas from other people (Noonan, 2007). Holding information which could evoke change in the current way of doing things becomes a strategy for people performing organizational defensive routines to stay in

control (Argyris, 1990).

Among these four sub-factors, ODRs have the highest correlation with knowledge interpretation in a negative direction (r =-0.47, *p* <0.01). This highly negative correlation could be explained by the manifestation of ODRs in the form of mixed messages (Argyris, 1990; Noonan, 2007). Mixed messages are defined as being inconsistent, undiscussable, ambiguous (Wilson, 2001). When this kind of message is adopted to convey the issues causing embarrassment or threat, message receivers could interpret the information incorrectly. Subsequently, it can result in poor organizational memory.

The findings suggest that formalization is negatively associated with organizational learning. This confirms our Hypothesis 2a. High formalization hinders organizational learning because formalization constrains people to make decisions based on rules and procedures instead of being based on situations (Child, 1972). Highly formalized organizations could increase efficiency and reduce cost in terms of meeting organizations' standards and deadlines, but this does not allow for any slack for organizations to reflect on their procedures and come out with creative ideas for (radical) changes (Lavie, Stettner & Tushman, 2010).

Third, the findings also show a non-significant relationship between organizational age and organizational learning. The theory section highlighted that age goes along with experience which is beneficial for organizational learning. In general, old organizations often have more knowledge of their market environment. However, their regular usage of the experience can disguise their ability to see the difference between organizational competence and environmental needs (Sorensen & Stuart, 2000). Therefore, old organizations might be better at exploitative learning rather

than exploratory learning (March, 1991). This requires future research to test whether the divergent effect of age is caused by the different types of learning. Because the data did not show statistical significance between these two factors and organizational learning. Hence, the insignificant moderation effect is a natural result of these relationship.

Forth, the findings of this study suggest that structure has more significant effect on organizational learning than age and size. The reason why it is this case could be that structure is detrimental to the control of decision making and autonomy (Grinyer & Yasai-Ardekani, 1980), but not age and size. Structure could also influence the way of coordination between employees (Mintzberg, 1983); it also affects the way of sharing information (Cohen, 1991). When organizations have a very centralized structure, the communication tend to flow from top to bottom, and is likely to be formal and regulated in order to generate stability (Sakalas & Venskus, 2007). This could potentially encourage employees at organizations to follow strict rules and procedures to protect themselves from contributing to unexpected outcomes. It also discourages employees to discuss mistakes and errors openly at organizations. Consequently, this kind of structure can potentially breed ODRs which tend to reinforce the centralized and formalized structure.

Finally, the study did not find statistically support for the moderating effect of ODRs on the relationship between centralization and organizational learning. There are three possible explanations of this non-significant relationship. First, the study used samples from different organizations with different levels of ODRs and different levels of centralization. Perhaps the testing of interaction in a specific sample of workers could result in a significant interaction effect as they have similar perception on the centralization and ODRs. Second, in most cases, small sample sizes have

implication of overestimation of any significant interaction terms (Brogh et al. 2013; Aguinis, 2004). Given sample size of this study (358) is not small, overestimation should not be an issue. Therefore, the research can interpret the moderating effect with some degree of confidence. Third, time of collecting data could affect moderating effect because ODRs are more prevalent when organizations are going through changes.

5.5.2 Implications

The findings of this study contribute to the current literature on both organizational learning and organizational defensive routines. Firstly, this empirical study provides support for the theoretical proposition on the importance of organizational structure for organizational learning (Dodgson, 1993; Fiol & Lyles, 1985). A less formalized organizational structure facilitates organizational learning. Secondly, the study shows that organizational age and size do not have much effect on organizational learning. That means organizational defensive routines negatively affect organizational learning regardless of organizational age and size. Thirdly, the present study investigates three basic organizational characteristics (structure, age and size) with respect to organizational learning.

This study also has some implications for practitioners. It is important for organizations to identify and reduce ODRs, as it can significantly prevent organizations from learning regardless of organizational age, size, structure and sector. A less formalized structure could encourage employees to communicate the issues at hand in accordance with the situations they are facing. By analyzing the different information and opinions collected from employees, organizations could understand the issues better so that they learn more than organizations with high

formalization. Furthermore, this study should sensitize managers for the fact that organizational defensive routines can negatively moderate the relationship between formalization and organizational learning. One way of reducing these negative routines is to have a culture embracing open discussion on issues which could evoke embarrassment and threat.

5.5.3 Limitations and future research

At least four limitations of this study should be pointed out. Firstly, this study applied the scale of ODRs at the organizational level. Literature shows that ODRs at the individual level and at the organizational level reinforce each other. Hence, testing the effect of collective ODRs on organizational learning creates incomplete understanding of the concept. Future studies should apply the scale of ODRs at individual level to an empirical study and assess their effect on organizational learning. Second, common method bias may affect the results. However, the researcher tried to control this through the survey design following recommendations by Podsakoff et al. (2003). For example, the researcher randomized the construct of ODRs with other constructs in the same questionnaire. The questionnaire is also self-administered and answered anonymously. Additionally, Siemsen et al. (2010) have shown that common method bias does not affect moderation effects. Hence the researcher's main results hold even under the presence of small CMB. Third, the researcher treated originally continuous variables such as age and size as if they were categorical. However, as a robustness check, the researcher compared two methods for each variable. First, following common practice the researcher treated the variable as quasi continuous variable. Secondly, the researcher categorized the

variable into dummy variables based on frequency. For organizational age, organizations operating for less than 21 years are considered young organizations; otherwise, they are old organizations. For organizational size, organizations with less than 500 employees are considered as small and medium enterprises (SME), otherwise, they are treated as large organizations. The last one is about the way of understanding organizational learning. Huber's cognition perspective of understanding learning procedures is adopted at this study. Even though the researcher appreciate this is a view of cognition that became outdated after the distributed/embodied cognitive revolution of the Nineties (e.g., Hutchins, 1995; Varela et al., 1992), the researcher deems that isolating these four components is useful. Clearly, with Huber's approach the researcher am only dealing with the 'information' component of learning and cognition. The researcher acknowledge it is not a broad view but it is a starting point.

This study empirically confirmed the negative effects of ODRs. The theory has suggested that centralization could negatively affect organizational learning, but our findings could not support this deduction consistently. Hence, future studies should be carried out to understand the relationship between centralization and organizational learning. Future studies could also focus to identify the antecedents of organizational defensive routines in order to help organizations reduce them. Last but not least, this study controlled the type of industries in order to control over the potential effect of different environmental dynamism. Public sector organizations are often considered to face a more stable environment and require less changes than private companies. Hence, this study only roughly divided industries into public, private and non-profit organizations. However, future studies could have more precise categorizations on industries. For example, a technological company and a

consumer food production company both belong to private sectors, but changes in technological companies could be more radical and volatile than the food production companies.

5.5.4 Conclusion

This chapter implemented the scale of ODRs into an empirical study. The finding of this study shows that ODRs moderates the relationship between formalization and organizational learning. This study partially tested the framework proposed in Chapter 2. As the above stated limitation pointed out it is necessary to assess the effect ODRs at individual level on organizational learning. The following chapter empirically evaluates the role of ODRs at the relationship between individual personalities and organizational learning.

CHAPTER SIX: ODRs, Personality Traits and Organizational Learning[8]

The previous chapter has empirically tested one part of the theoretical framework developed in Chapter 2 which assesses the role of ODRs on the relationship between organizational factors and organizational learning. This chapter empirically tests the other part of framework which is about the role of ODRs on the relationship between individual personality and organizational learning. The researcher realizes that there is some repetition on structuring hypotheses which have been discussed in Chapter 2 for constructing propositions. However, the researcher thinks the repetition could enhance readability of this chapter.

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[8] A paper is based on this chapter was presented at the 2016 European Academy of Management Annual Conference.

6.1 Introduction

The purpose of this chapter is to analyze what roles ODRs play in the relationship between individual personality traits and organizational learning. A pervasive assumption in the literature on ODRs is that they hinder learning, are overprotective and self-sealing (Argyris, 1990). However, as previous chapters already pointed out, there is a lack of empirical support on this assumption. The prevalence of ODRs and limited understanding of ODR call academics to provide systematic evidence to further comprehend such learning barriers.

Chapter 2 discussed organizational learning from the perspective of individual learning theory which posited that individuals are agents of learning (Argyris & Schon, 1978). The importance of individuals in organizational learning is depicted clearly through Simon (1991, p.125) generalized two mechanisms of how organizations learn "(a) by the learning of its members or (b) by ingesting new members who have knowledge the organization didn't previously have". Each one of the two creates collective learning that is grounded in individuals. Nevertheless, it should not be misunderstood that organizational learning is equal to individual learning, because organizations can operate even when any specific individual leaves (Kim, 1993) but not when every participant leaves — there would be no organization in that case (Scott, 2003). However, the process of institutionalizing integrates individual learning into the organization resulting in coherent interactions of members in organizations (Crossan, Lane & White, 1999). Hence, organizations can learn independently from any individual, but simultaneously also rely on the collection of individual learning. Consequently, individuals play a decisive role in organizational learning. Surprisingly, very little research has explored how

individual characteristics affect learning in organizations.

ODRs have a significant psychological component and lean on rather passive cognitive mechanisms (Secchi & Bardone, 2013). Personality influences learning styles and, for example, academic outcomes (e.g. Klein & Lee, 2006; Noftle & Robins, 2007). Klein and Lee (2006) studied 157 students and concluded that learning goal orientation relates positively and significantly to conscientiousness and openness to experience. Because individual learning is one essential part of organizational learning, it is rational to assume that individuals' personality would affect institutional learning ultimately. Researchers also found individuals' personality traits influence knowledge sharing and knowledge acquisition in the workplace (Matzler, Renzl, Mooradian, von Krogh & Mueller, 2011a). Some organizations use personality tests (e.g. Big Five Dimensions) in personnel selection (Hurtz & Donovan, 2000). Hence, individual personality can be crucial for the understanding of organizational learning. However, the puzzle is that even organizations with high quality selection processes still fail to reach their expected learning outcomes (Gino & Staats, 2015). The researcher argues that organizational defensive routines may interfere with the effect personality traits have on organizational learning.

Hence this chapter makes three contributions to the literature. First, the researcher provides empirical evidence on the relation between personality traits and organizational learning. Second, the researcher theoretically and empirically integrates ODRs into the model thereby extending knowledge on a particular set of routines that is likely to be a barrier to organizational learning. Third, the results are of relevance for researchers and practitioners alike as they strive to improve organizations' learning capabilities.

6.2 Theoretical Framework

6.2.1 Organizational learning

The importance of organizational learning has been discussed in Chapter 2 and again in Chapter 5. Chapter 2 reviews organizational learning from three perspectives, individual learning theories, social learning view and organizational routines. These perspectives interpret learning differently, but they all positon individuals as learning agents through which organizations learn. Chapter 5 specifically adopted a learning model created by Huber (1991) which treats organizational learning as an information process including knowledge acquisition, knowledge dispersion and knowledge interpretation and organizational memory. This view of organizational learning once again emphasizes the importance of individuals at transferring knowledge from individual level to institutional level.

6.2.2 Personality traits

Chapter 2 showed that individual learning is considered a component of organizational learning (Kim, 1993). Organizational learning is a mixture of individual, group and an organizational level of learning. Individual learning is recommended as the first step of learning at the social level, through which alternative solutions to organizational issues are recognized based on individual experience (Crossan et al., 1999). As important as individual learning is to organizational learning, individuals' characteristics may, to some extent, be able to explain organizational learning.

Despite the recognition of the importance that individual learning processes have on the organization, little research has been conducted in estimating the effect of

individual characteristics such as personality traits on organizational learning. Personality is a psychological concept while learning is mostly cognitive. Huber's (1991) framework (see above) has the potential to explain how the effects of personality can be transferred to cognitive learning. This is easily done if one realizes that information distribution, for example, requires a particular prosocial personality to be executed. Or, for example, knowledge interpretation is mostly based on social psychological mechanisms that operate together with the most obvious cognitive processes. In other words, the characterization of Huber's model provided above indicates that workers' personalities are extremely important to understand proactive engagement in organizational knowledge processes.

This research adopts the Big Five personality traits to understand the relationship between personality traits and organizational learning. The reason for selecting Big Five is because it is a dominant framework that is used for personnel selection (Hurtz & Donovan, 2000). Modern personality research uses the Big Five to systematically categorize personality traits at the broadest level (Flynn, Chatman & Spataro, 2001). The Big Five are also considered as a 'parsimonious and comprehensive' way to describe the human sphere (Gupta, 2008). The Big Five traits comprise neuroticism, extraversion, agreeableness, openness to experience and conscientiousness.

The study in this chapter focuses on three traits, namely, conscientiousness, openness to experience and neuroticism. This is because the literature suggests that conscientiousness and neuroticism are robust and consistent predictors of job attitudes (Judge & Ilies, 2002). Openness to experience is often used to explain knowledge sharing and decision making in organizations (LePine, Colquitt & Erez, 2000; Matzler, Renzl, Müller, Herting & Mooradian, 2008). Therefore, these three traits should be particularly relevant in understanding the relationship between

personality traits and organizational learning.

Openness to experience. Openness to experience is often linked with characteristics such as being imaginative, open-minded, aesthetic sensitivity, originality and intellectual curiosity (Barrick & Mount, 1991). People with high level of openness are willing to engage in self-monitoring and assessment which is necessary for identifying learning possibilities (Blickle, 1996). Open individuals tend to try new things, experience different feelings and embrace changes (LePine et al., 2000). Hence, open individuals are more ready to participate in learning (Barrick & Mount, 1991) and tend to have a high learning orientation (Matzler, Renzl, Mooradian, von Krogh & Mueller, 2011b). Individuals high in openness to experience are more willing to query other people's insight and share their own knowledge, it is anticipated that open individuals are more likely to involve knowledge acquisition and dissemination with teams (Matzler et al., 2008).

(Note: Numbering hypothesis continues from the previous chapter in order to be consistent with the framework developed at Chapter 2*).*

Hypothesis 5a: Openness to experience is positively related to organizational learning.

Conscientiousness. Conscientious people are considered to be independent, organized, responsible, achievement oriented and perseverant (Barrick & Mount, 1991). People who are perseverant tend to be committed to their goals regardless of

difficulties they are facing, and they are more likely to weigh different information in order to accomplish tasks (LePine et al., 2000). People who assess different information might have a more accurate interpretation resulting in better decision making than people who are less conscientious (LePine et al., 2000). Furthermore, empirical studies on organizational citizenship found that conscientiousness drives people to work on extra things which go beyond their job requirement, and conscientious people also enjoy working with other people in a team and help organizations as a whole (Organ, 1994). It is rational to predict that people enjoying affiliation in organizations may be more likely willing to exchange information resulting in better knowledge sharing in organizations. Empirical research among IT professionals has showed that a high level of conscientiousness is positively related to tacit knowledge sharing (Borges, 2013). Highly conscientious people also show high tendencies of documenting knowledge for organizational usage (Matzler et al., 2011a). While new knowledge is institutionalized, it will become part of organizational memory to guide future decision-making. Consequently, it will contribute to organizational learning.

Hypothesis 6a: Conscientiousness is positively related to organizational learning

Neuroticism. Neuroticism sometimes is labeled as "emotionality" and "negative affectivity" (Watson & Clark, 1984). People with high neuroticism are likely to experience a high degree of negative affect such as anxiety, stress, and depression and negative self-assessment (Gore, Kiefner, & Combs, 2012). Highly neurotic people are less happy to share tacit knowledge (Borges, 2013), it is more challenging for them to adjust in new circumstances (Gore et al., 2012), they tend to be less satisfied with their job (Barrick, Mount & Judge, 2001) and are more likely to remember negative experiences that happened in the workplace (Watson & Clark,

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1984). In terms of organizational learning, this requires employees' participation in detecting and correcting the problematic aspects of their own behavior, and in turn, it improves the processes of large organizations (Mazutis, Slawinski & Slaiwinski, 2008). Highly neurotic people are less confident in promoting their own opinions and handle criticism from other people in a way that has negative repercussions on themselves (Borges, 2013). Organizational learning often involves negotiation and argument in order to achieve a shared mental map before learning happens (Huber, 1991) and neurotic people may find the process stressful.

Hypothesis 7a: Neuroticism is negatively related to organizational learning.

6.3 Organizational Defensive Routines

As previous chapters already suggested that social virtues are learned from early life and become guidance to behavior in later work life for handling situations which normally elicit embarrassment or threat to themselves or others. However, in the organizational context, the disposition to be nice to colleagues could motivate people to self-censoring or sugarcoating important organizational information. In turn, this may result in destructive behavior in organizations. This section explains ODRs from a social cognition view.

The way how organizational culture influences on individuals' behavior can be explained from a social cognitive studies in that they propose that social context influences an individual's way of interpreting information people generate or information received from other people (Fiske & Taylor, 2013). In particular, attribution theory suggests that individual's behavior is an outcome of personal attributions and contextual attribution (Augoustinos, Walker & Donaghue, 2009). In this study's context, individuals who perform defensive routines do that because they

focus on avoidance of negative consequences and they are preoccupied of staying in control with an organizational culture which treats failure as embarrassment (Secchi & Bardone, 2013).

According to Bandura (2012), people learn their behavior via interpersonal influences with other people by observation. In return, their learnt behavior will shape or reinforce the external environment (Bandura, 2012). For defensive routines, individuals design mixed messages to avoid evoking embarrassment for themselves or others. However, the message receivers recognize the inconsistency of the information, but sometimes decide to be in congruence with the message senders' way of dealing with the source of embarrassment. This double-blind way to conceal the cause of embarrassment makes ODRs identification a real challenge (Argyris, 2001). As a consequence, individuals behave defensively because it is socially acceptable.

6.4 Integrating Different Levels of ODRs with Social Cognition

An individual's motives to perform organizational defensive routines depend on their self-assessment about whether their candid opinion can cause embarrassment or put themselves at a risk. This self-assessment is conducted in an individual's mind privately. Without deliberate reflection initiated by an external source (e.g. consultants) on their behavior, the organizational defensive routines are considered as rational by performers (Noonan, 2007). Their rationality comes from their deepest and implicit assumption which is to defend themselves from pain and simultaneously cover up the cause of pain (Senge, 1991). Thus, organizational defensive routines are the outcome of both individual and organizational factors.

At an individual perspective, the motive of performing defensive routines is seen

related to an individual's cognition (e.g. their mental assumption on embarrassment and change) and external stimuli from social context. Why do other people (e.g., co-workers, managers, etc.) join this dysfunctional behavior? One way to understand this integration process from individuals to organizational level is to consider organizational defensive routines as a collective behavior that is distributed to individuals in organizations. However, it should not be misunderstood that organizational defensive routines are a simple sum of individual defensiveness. Organizational defensive routines are understood as a phenomenon that supports and stimulates individual defensiveness. Argyris simply put it as "people are the carriers of defensive routines, and organizations are the hosts. Once organizations have been infected, they too become carriers" (Argyris, 1985 cited in Senge, 1991, p. 234). Hence, individual defensive routines and organizational defensive routines reinforce each other. Studying one without the other could generate incorrect understanding of organizational defensive routines.

According to social cognition, ODRs are considerably stable and automatic via social cognition. When a social cognition process meets any of the following qualities it is considered automatic: unintentional, uncontrollable, efficient, autonomous responses and outside awareness (Bargh, 1989). In terms of the process of ODRs, these are peoples' effortless behavior under a situation which is most likely to cause embarrassment and threat to the initiators or receivers in the workplace (Argyris, 1990). People's defensiveness results in anti-learning attitudes and limits learning in all levels, but people who are involved in the process of ODRs tend to shift blames on to other people and fail to realize their own contribution to such counterproductive behavior (Noonan, 2007). Hence, defensive behavior also is an

unintentional and undeliberate behavior in situations where embarrassment and threat are mostly likely to be stimulated. Therefore, it is context based. Because of organizational defensive routines' automatic characteristics, it shares the characteristics as general routines being repetitive, recurrent and stable.

6.5 Organizational Defensive Routines: Hypotheses Development

Hypotheses 5a to 7a posit that individuals' personality traits (openness to experience, conscientiousness, neuroticism) influence and contribute to explaining organizational learning. But how do ODRs and these traits interact with respect to organizational learning? This section develops the hypothesis that organizational defensive routines act as a moderator in this relationship.

People with high openness to experience have shown willingness to knowledge sharing and learning (Matzler et al., 2008). When the level of ODRs is high, certain issues, which may elicit embarrassment and threat, are considered as inappropriate or counterproductive to reveal. In other words, organizations with high organizational defensive routines lack a culture to encourage open discussion and appreciate innovative ideas. This kind of culture may constrain people with high openness to experience from freely expressing their opinion. Consequently, it will demotivate 'open' people to share their knowledge.

Hypothesis 5b: *Organizational defensive routines moderate the positive relation between openness to experience and organizational learning, such that the relationship is weaker when organizations have high organizational defensive routines.*

Organizations with high ODRs tend to use ambiguous language to convey negative messages (Noonan, 2007). The opaque information can be misguiding for

employees to work towards their goals. Given that conscientious people are goal driven (Barrick et al., 2001), they may find it frustrating to work on a vague goal. If they clarify the ambiguity of the message, they will have to query the reason why the message was designed as ambiguous initially. This could embarrass the message initiator. If they pretend the non-existence of ambiguity of the message, they may end up doing the wrong things. High ODRs also cause certain valuable information to be hidden under the carpet (Argyris, 1990). The fragmented information creates barriers for people with high conscientiousness from having correct understanding of the situation. When people's abilities of identifying errors are constrained by the organizational defensive culture, it is challenging to generate learning in organizations. Thus, the researcher hypothesizes:

Hypothesis 6b: Organizational defensive routines moderate the relationship between conscientiousness and organizational learning, such that the relationship is weaker when organizations have high organizational defensive routines.

Highly neurotic people were predicted to be not good at adjusting to changes (Watson & Clark, 1984). Organizations with high ODRs tend to avoid conflict and embarrassment, so the working environment seems 'nice'. Whereas, this so called 'nice' working environment only produces temporary changes in behavior, or mediocre adjustment to current organizational practice (Argyris, 1990). Neurotic people working in this kind of organization find it comfortable. It may reinforce neurotic people's negative thinking on change and it may encourage neurotic people to hold valid information which may trigger the change in organizations.

Hypothesis 7b: Organizational defensive routines moderate the relationship between neuroticism and organizational learning, such that the relationship is stronger when

organizations have high organizational defensive routines.

6.6 Method

6.6.1 Data and sample

This chapter used the same sample as the study at Chapter 5. It also had 440 participants who completed the survey. After deleting unengaged participants and outliers, the final usable data is 351 participants. 51.4% of the sample is male, and 48.6% are female. 79% of respondents work at full time jobs. The average age is 38 and the standard deviation is 11.66.

In terms of reducing common method bias, the researcher randomized the order of questions (Podsakoff et al., 2003). The researcher also employed the single factor test (Harman, 1967) by forcing all the predictors and outcome variables to load on one factors to check common method bias. The result shows that one factor only explains 20.71% of total various (61.95). Statistically this suggests there is no common method bias issue.

6.6.2 Variables

The main predictors of the study are conscientiousness, openness to experience and neuroticism. Additionally, the study controls for gender, education, age, tenure, job status (full time or part time). Job positions in organizations have an influence on the knowledge of organizational issues. Generally, people at the managerial level are more involved than general staff in decision-making on organizational changes and learning. Full-time employees spend more time in organizations, they may have a different opinion than people working part-time. The researcher also controlled for age, size of organizations due to their known influence on organizational learning.

6.6.3 Measures

Participants indicate their agreement with each item using a 7-point Likert-type scale running from 1 (strongly disagree) to 7 (strongly agree).

6.6.3.1 Dependent variable

Organizational learning. this study also used the same scale of measuring organizational learning as it is in Chapter 5. The scale is developed by Pérez López, Peón, and Ordás (2004) and tested by Jiménez-Jiménez and Sanz-Valle (2011) and Pérez López, Peón, and Ordás (2005). The overall scale has a reliability of alpha = 0.91.

6.6.3.2 Independent variables

Personality traits (openness to experience, conscientiousness, and neuroticism). The researcher measured these three traits with 27 items from John & Srivastava's work (1999). It had nine items for conscientiousness (alpha = 0.83), eight items for neuroticism (0.83) and ten items for openness to experience (0.77). The example items are: "Does a thorough job" and "Can be somewhat careless" (reverse coded) are measures conscientiousness; "has few artistic interests" (reverse coded) and "is curious about many different things" measures openness to experience; "worries a lot" and "is emotionally stable, not easily upset" measures neuroticism.

Organizational defensive routines: This is a newly developed measurement and is composed of 14 items. Eight items measure individual perception on organizational defensive routines at the organizational level. Six items measure individuals' perception on organizational defensive routines at the individual level. The process of developing the scale of ODRs is described at Chapter 4. Chapter 4 shows that the scale has gone through various validity tests such as CFA, discriminate and

convergent validity test, predictive validity test and cross-cultural measurement invariance test. All of the tests show the scale is reliable and meets generally accepted cut-off values for fit indices (Hu & Bentler, 1999; Nunally, 1978). Each level of analysis has two sub-factors. This chapter focuses on ODRs at an individual level, it contains embarrassment avoidance (alpha = 0.80) and rigidity (alpha = 0.77). The overall Cronbach's alpha for measuring organizational defensive routines is 0.74. "When dealing with work-related procedures and processes, I do not like changes" is an example item to measure rigidity. "I avoid speaking to the point if this would embarrass my colleagues" is an example item to measure embarrassment avoidance.

6.7 Analysis and Result

6.7.1 Descriptive statistics

Means, standard deviation, reliability coefficients and correlations for the measures appear in Table 14. Before addressing the hypotheses, it is worth noting that organizational learning is negatively correlated with neuroticism ($r = -0.32$, $p < 0.01$), but positively correlated with conscientiousness ($r = 0.19$, $p < 0.01$) and openness ($r = 0.32$, $p < 0.01$). Organizational learning is not correlated with organizational defensive routines ($r = -0.04$, $p > 0.05$). Organizational defensive routines are positively and significantly correlated with neuroticism ($r = 0.45$, $p < 0.01$), but negatively and significantly correlated with conscientiousness ($r = -0.37$, $p < 0.01$) and openness ($r = -0.29$, $p < 0.01$). This suggests that people with high neuroticism generally tend to display more defensiveness in a situation when embarrassment and threat may occur.

Table 14:Descriptive Information about Variables

	Mean	Std.	1	2	3	4	5	6	7	8	9	10	11
1.Gender	0.52	0.50											
2.Age	38.50	11.63	0.11										
3.Education	2.28	1.01	-0.10	-0.19**									
4.Tenure	2.92	1.43	0.15**	0.52**	-0.15**								
5.Firm Size	3.03	1.03	0.06	0.01	0.14**	0.14**							
6.Full time	0.78	0.41	0.29**	-0.03	0.08	0.07	0.10						
7.Supervisors	0.50	0.50	0.14**	0.16**	0.14*	0.15**	-0.18**	0.17**					
8.Conscientiousness	5.17	0.87	-0.08	0.31**	-0.14*	0.15**	-0.04	-0.01	0.11*	**0.83**			
9.Neuroticism	3.69	1.07	-0.08	-0.16**	-0.02	-0.11*	-0.05	-0.08	-0.15**	-0.48**	**0.83**		
10.Openness	4.74	0.77	0.03	0.07	0.15**	-0.03	-0.05	0.05	0.20**	0.38**	-0.22**	**0.77**	
11.iODR	3.93	1.06	0.05	-0.33**	-0.03	-0.12*	0.07	0.03	-0.25**	-0.37**	0.45**	-0.29**	**0.74**
12.OL	4.74	0.96	0.02	-0.03	0.10	0.02	0.12*	0.08	0.05	0.19**	-0.32**	0.32**	-0.04	**0.91**

Note: N=351; **p<0.01; *p<0.05 ; OL= organizational learning. iODR=Organizational defensive routines at individual level; Cronbach alpha is on the diagonal. Con= Conscientiousness

Full time is coded as "1", others are codes as "0"; Supervisors includes supervisors, middle level management and senior level management is coded as "1" and general staff is coded as "0"

6.7.2 Personality traits and organizational learning

Multiple regression analyses are used to examine the relationship between personality traits and organizational learning. Organizational defensive routines and variables for personality traits are centered. Variance Inflation Factor (VIF) for all the variables is at an acceptable level. The mean VIF is 1.35. The single highest VIF is 1.76. Thus, there are no strong concerns about multicollinearity.

The main results are presented in Table 15. Model 1 (see Table 15) only including control variables shows that only organizational size is positively associated with organizational learning. That means as organizations get older, they learn better. Model 2 added the main predictors, namely conscientiousness, neuroticism and openness to experience. It shows that conscientiousness ($\beta = -0.02$; $p = 0.77$) does not have any influence on organizational learning and this leads us to reject Hypothesis 6a. Neuroticism can negatively and significantly predict organizational learning ($\beta = -0.26$; $p < 0.001$). Openness to experience also has a significant, but positive influence on organizational learning ($\beta = 0.34$; $p < 0.001$).

Model 3 (see Table 15) investigates the interactions between organizational defensive routines and the three personality traits of interest (conscientiousness, neuroticism, openness). Results show that conscientiousness stays non-significant to organizational learning ($\beta = -0.01$; $p = 0.90$). Neuroticism ($\beta = -0.31$; $p < 0.001$) and openness to experience ($\beta = 0.37$; $p < 0.001$) maintain their significance. Therefore, the researcher can conclude that neuroticism and openness to experience are significant predictors of organizational learning. Therefore, hypothesis 6a is rejected while hypothesis 5a and hypothesis 7a are supported. Unexpectedly, model 3 also shows that organizational defensive routines ($\beta = 0.43$; $p < 0.001$) have a positive

significant direct association with organizational learning.   An analysis on correlations of organizational defensive routines with four components of organizational learning are not significant except of knowledge interpretation ($r = -0.11$, $p < 0.05$).   That means the higher ODRs is related to the lower knowledge interpretation in organizations.

Although theoretically the researcher has proposed that organizational defensive routines will negatively moderate the relationship between personality (conscientiousness, neuroticism and openness) and organizational learning, the result of data analysis (see Model 3) does not support the hypotheses. That means the level of organizational defensive routines does not have a statistically significant effect on the relations between personality traits (openness to experience ($\beta = 0.04$, $p = 0.60$), conscientiousness ($\beta = -0.07$, $p = 0.32$) and neuroticism ($\beta = 0.06$, $p = 0.23$)) and organizational learning. Hence, hypotheses 5b, 6b and 7b on the moderation effect of organizational defensive routines are not supported.

Table 15: Regressions results for Conscientiousness, Neuroticism and Openness

DV=OL	Model1		Model2		Model3	
	β	p	β	p	β	p
(Constant)	4.19	0.00**	4.58	0.00**	4.42	0.00**
Age	0.00	0.62	-0.01	0.12	0.00	0.45
Gender	0.00	0.99	-0.04	0.72	-0.08	0.44
Education	0.06	0.26	0.02	0.73	0.02	0.62
Firm size	0.11	0.03*	0.11	0.02*	0.11	0.02*
Full time	0.11	0.39	0.07	0.56	0.05	0.70
Supervisors	0.12	0.27	-0.02	0.87	0.03	0.74
Tenure	0.10	0.82	0.02	0.57	0.01	0.82
Conscientiousness			-0.02	0.77	-0.02	0.73
Neuroticism			-0.26	0.00	-0.31	0.00**
Openness			0.34	0.00	0.37	0.00**
iODR					0.18	0.00**
iODR* Conscientiousness					-0.07	0.32
iODR * Neuroticism					0.06	0.23
iODR * Openness					0.04	0.60
Observation (351)						
R2			0.03		0.19	0.22
Adjusted R2			0.01		0.17	0.19
F	F(6), 1.74, p=0.11		F(9), 8.85, p<0.001		F(13), 7.49, p<0.001	

Note: *p<0.05; **P<0.01, 1. Job status is dummy variable. Full time is coded as 1, part-time is coded as 0.   2.Tenure is dummy variable. 1-5 years is coded as 1; others are coded as 0. 3.Job position is dummy variable. Supervisors, middle managers, senior managers and executives are coded as 1. General staff is coded as 0.   4. iODR= defensive routines at individual level

6.8 Discussion

The study in this chapter makes three contributions to the literature. First, by examining three well-studied personality traits (conscientiousness, neuroticism and openness to experience) and organizational learning, it empirically showed that individual traits can influence organizational learning. Hopefully, this will stimulate more empirical studies to explore what other individual factors can affect organizational learning. Second, the positive relationship found between ODRs and organizational learning brings a novel perspective to the existing literature on ODRs and learning. Third, the findings of this study enrich the literature on both organizational learning and ODRs. They also benefit practitioners wishing to improve learning capabilities by carefully selecting people.

The findings of the study did not show statistical support for the hypotheses that ODRs negatively moderate the relation between personality traits (conscientiousness, neuroticism and openness to experience) and organizational learning. Because these findings deviate from theory as presented in earlier sections, the researcher uses OLS regression analysis to test what the effect of ODRs sub-factors are on the components of organizational learning. The results indicate that rigidity significantly and positively relates to organizational memory ($\beta = 0.48$, $p < 0.05$) only. This is consistent with Argyris' (1990) theory on ODRs leading to routine learning. However, "embarrassment avoidance" is significantly and positively related to all the components of organizational learning. This finding contradicts the existing literature which advocates the negative influence of organizational defensive routines on organizational performance, decision making and learning (e.g. Argyris, 1990; Ashforth & Lee, 1990; Noonan, 2007). Two potential reasons can explain this

finding. Firstly, ODRs may not be as bad as Argyris originally portrayed them. Though Argyris tends to attribute the roots of organizational dysfunctions to ODRs and politics, some authors (e.g. Miner & Mezias, 1996) pointed out that avoiding embarrassment is not necessarily negative behavior. In fact, such behavior may be seen as part of the normal process of resolving differences of opinion between organizational members and an inevitable consequence of the different interests that are created by the process and technology of organizing' (Easterby-Smith, Snell, & Gherardi, 1998, p. 263). Miner and Mezias (1996) suggested that covering up and by passing issues related to embarrassment and threat only can encourage incremental and routine learning which is also an important part of organizational development. ODRs are not as well studied as incremental learning.

Secondly, it was explicitly stated by Argyris (1990, 2001) and agreed by some other scholars (e.g. Riley, Cudney & Long, 2013; Wilson, 2001; Yau & Cheng, 2011) that organizational defensive routines are anti-learning. However, organizational learning can take various shapes. Argyris (1990) divided learning into single-loop and double-loop. Fiol & Lyles (1985) equated single-loop learning to low levels of learning, and double-loop learning to high level of learning. It was not clear if "anti-learning" here means a specific kind of learning. Most of Argyris' (1990, 1993, 2002) work focuses on advocating the idea of dysfunctional effects of organizational defensive routines on double-loop learning. If learning can be divided into levels, maybe organizational learning should be measured in its components. the findings of this study may reveal to be different and this implies that more research is needed. Building on the thought of measuring organizational learning based on levels, the researcher also agrees with Huber (1991) that different levels of learning may be

extremely difficult to isolate empirically as one aspect can overlap and/or be intertwined with another as well as mask or determine another. Some existing research on explorative (double-loop) and exploitative learning (single – loop) suggested these two levels learning are complementary, coexist in organizations (e.g. Lavie et al. 2010; Kim et al. 2012). Thus, the complexity of measuring organizational learning and also contributed to the seemingly unusual finding.

This study also revealed how individuals' personality traits affect organizational learning. High neuroticism has a negative effect on organizational learning. High openness to experience has positive influence on organizational learning. Though research on academic and job performance has produced consistent and positive findings on conscientiousness (e.g. Barrick et al., 2001; Blickle, 1996), this study is not able to support them. One plausible reason to explain why conscientiousness does not explain learning in this study stems from the perspective of learning itself. Learning is about potentially changing behaviors (Huber, 1991). Hence, individuals being open minded and thinking out of box are more likely to identify alternative ways of improving their work. People high on conscientiousness have the characteristics of order, dutifulness and deliberation (Barrick and Mount, 1991) which are important for goal achievement. However, people with high conscientiousness could be too focused on following orders, and thus, do not notice the need for change in their behavior for better learning. High conscientious people are not as good at adapting to a changing task as people with low conscientiousness (LePine et al., 2000). Originally, the researcher thought being orderly and persevere could help individuals to restore knowledge in organizations so that they could

contribute to organizational learning. However, the researcher did not consider the possibility that individuals scoring high in conscientiousness could prefer to maintain routine rather than seeking new ways of doing things which might explain the finding. In addition, on the one hand, conscientious individuals tend to engage in self-deception which is used to avoid self-confrontation and attributions of failure (Martocchio & Judge, 1997). The self-deceivers are likely to adopt a cognitive strategy to deny negative attribution to their self-image, which could lead to diminish learning opportunities at the early stage of learning (Lee & Klein, 2002). On the other hand, high conscientious people are also high self-efficient (Martocchio & Judge, 1997). Individuals who have high self-efficacy tend to set high challenging goals and perform better at learning (Lee & Klein, 2002). The dual mediating roles of negative self-deception and positive self-efficacy negate each other resulting in insignificant relationship between conscientiousness and learning (Martocchio & Judge, 1997). This might also be the reason to explain the finding of this study.

This study also has some implications for practitioners. This study suggests that openness and neuroticism are relevant factors for organizational learning. In the current competitive market place, organizations embrace the idea of being learning organizations. Individuals are an implicit and valuable organizational asset for organizations to achieve their idea of constant learning. Organizations may give more preference to individuals who are high at openness to experience for initiating creative ideas. Training on the knowledge of individual personality and organizational learning can help individuals understand how their own personality can either assist organizations to learn better or become a barrier for organizational learning unconsciously.

This study also contributes to explain the reason why employees are resistant to change. Resistance to change has been concluded as one source leading to the failure of many large-scale corporate change programs (Bovey & Hede, 2001). The finding of this study shed some light on the causes of resistance to change. It shows that people perceive their defensiveness as a rational reaction toward the threat of their self or organizational interest. This perception leads them to cover up and bypass certain organizational issues. Traditionally, change agents are described as "angels", but people being changed are demonized as being "mulish and obstinate" (Dobosz-Bourne & Jankowicz, 2006, p. 2030). This finding indicates that maybe it is time to appreciate certain resistant behavior or make some effort to understand their reasons to against change before labelling them as trouble makers. The current trend of studying resistance to change started to challenge the traditional understanding of this concept (e.g. Dobosz-Bourne & Jankowicz, 2006; Thomas & Hardy, 2011)

Finally, there are two possible explanations that why the interaction effect of ODRs on all the relationship between individual factors and organizational learning is non-significant. First, the research did not consider organizational context. If the sample is collected at the time when organizations remain in a stable development, less challenges to the established rules happen in organizations. ODRs could be perceived as rational practice. Second, the sample size could also contribute to non-significant finding. Aguinis (2003) suggested that 800 cases are needed for studying moderation. Considering the sample of this study is comparably large (N=351), there is some confidence of interpreting the findings of moderating effect.

6.9 Limitations, Future research and Conclusion

This study has some limitations that require discussion. First, the accuracy of information the researcher asked from respondents might be a problem. Some individuals may not have the knowledge about organizational issues. The study disqualified respondents who have less than one year of experience in order to improve the reliability of organizational information the respondents provided. Second, the researcher has grounded the model in the degree to how personality traits will affect organizational learning. This removed the researcher's focus on the possibility of exploring how personality traits contribute to organizational defensive routines. For example, the data in this study showed a high correlation between neuroticism and organizational defensive routines. Neuroticism has also found be an explanatory factor to employees' behavior on censoring organizational information (Brinsfield, 2013). This deserves further exploration in the future. The third limitation is related to the measurement of organizational learning. Due to the divergent and complex concept of organizational learning (Easterby-Smith et al., 1998), it is easy to conceptualize learning, but challenging to systematically study organizational learning with quantitative studies (Miner & Mezias, 1996). The measurement has proven to be robust (Pérez López et al., 2004), but it did not divide learning into low and high level of learning. However, the literature studied organizational defensive routines against different levels of learning. Therefore, using this measurement of organizational learning may not be ideal. However, the measurement choice is restricted by the lack of valid measurement scales on low or high levels of organizational learning until now.

Future research should analyze the relationship between each phase of organizational learning and the different types of personality traits. The idea is stimulated by the

finding on conscientiousness which shows a non-significant relation to learning. In consideration of its consistent positive effect on work performance (e.g. Judge & Llies, 2002), this finding is unexpected. Future research could explore the possible mediator or a moderator which may need to be incorporated into this model. For example, Martocchio and Judge (1997) included self-deception and self-efficacy into a model to understand the effect of conscientiousness and learning.

Furthermore, the way the researcher collected samples may have some influence on the finding. Organizational defensive routines are an automatic and unconscious behavior employees perform in organizations. They become more prevalent when people are going through changes in organizations (Noonan, 2007). Because changes involve uncertainty and risk, this uncertainty of future can catalyze organizational defensive routines in organizations in order to keep status quo. Longitudinal data collected when organizations are going through a turbulent scenario will capture this negative performance better and future research should strive to collect such data.

6.10 Summary

This chapter empirically tests the moderating role of ODRs on the relationship between personality traits (conscientiousness, openness to experience and neuroticism) and organizational learning. Though the findings of the data analysis did not support the theoretically assumption on that the level of ODRs can moderates the impact of personality traits on organizational learning, yet these unexpected findings stimulation further exploration on ODRs. The following Chapter 7 provides a general discussion on the findings of all the studies.

CHAPTER SEVEN: General Discussion and Conclusion

The implication and contribution has been discussed in their respective chapters. This chapter discusses the implications of all the findings for academics and management practitioners. In so doing, it first provides a brief summary of the findings for the whole thesis. Then it discusses the implications based on these findings.

7.1 Summary of Findings

Theoretically the study deduces that ODRs could moderate the relationship between organizational factors (size, age and organizational structures) and organizational learning. Theoretical deduction also shows that ODRs could moderate the relationship between personality (conscientiousness, neuroticism, and openness to experience) and organizational learning. This theoretical framework serves as a guideline for the empirical studies. In order to test this framework, the study devotes a whole chapter to explain the process of scale development. The result of the study shows that ODRs are composed of two levels, namely organizational and individual levels. The organizational level of ODRs is measured by two factors (with four sub-items), *organizational cover-up* and *organizational pretense*. The individual level of ODRs is measured by two factors, namely *embarrassment avoidance* and *rigidity at work* (with six sub-items).

The verified scales are applied to two empirical studies to test the framework in Chapter 5 and Chapter 6. Chapter 5 finds statistical evidence to support that ODRs moderate the relationship between formalization and organizational learning,

increasing the negative impact that the former has on the latter. The study also finds that formalization and centralization are negatively associated with organizational learning, but fails to find the hypothesized effect of ODRs as a moderator on the relationship between centralization and organizational learning.

The verified scale of ODRs at an individual level is applied to an empirical study in Chapter 6. The findings indicate that openness to experience is positively related to organizational learning, and neuroticism is negatively related to organizational learning. Surprisingly, the study does not find statistical evidence to support the moderating effect of ODRs on these relationships which are theoretically hypothesized. In contrast with mainstream literature which suggests the negative effect of ODRs on organizational learning, this study shows that ODRs at an individual level are positively related to organizational learning.

Table 16 summarizes the findings of the empirical studies. These findings offer meaningful theoretical contributions to the literature on organizational defensive routines, organizational learning and organizational routines.

Table 16: Summary of Support for the Hypotheses across Two Empirical Studies

Hypothesis Number	Hypothesized Relationship	Support in Chapter 5	Support in Chapter 6
1a	Centralization → OL (-)[a]	Yes	
1b	ODR s Moderate (Centralization→ OL)	No	
2a	Formalization → OL (-)	Yes	
2b	ODR Moderate (Formalization→ OL)	Yes	
3a	Size → OL (-)	No	
3b	ODRs Moderate (Size→ OL)	No	
4a	Age → OL (-)	No	
4b	ODR Moderate (Age→ OL)	No	
5a	Openness → OL (+)		Yes
5b	ODR s Moderate (Openness→ OL)		No
6a	Conscientiousness → OL (+)[b]		No
6b	ODRs Moderate (Conscientiousness→ OL)		No
7a	Neuroticism → OL (-)		Yes
7b	ODRs Moderate (Neuroticism→ OL)		No

Note: OL= organizational learning.   [a] means the relationship of two variables is negative; [b] means the relationship of two variables is positive.

7.2 Overall implications of the findings

The implications of this work are discussed in the following sections from three vantage points: organizational defensive routines, organizational learning and organizational routines.

7.2.1 Implications for organizational defensive routines

This study developed a scale to measure ODRs at two levels. This new scale enriches the existing theory of understanding ODRs. First, it clarifies the definition of ODRs. The original definition of ODRs captures some main characteristics of ODRs, such as avoidance of embarrassment and threat (Argyris, 1990). However, there is no clear link with general routines, and it also restricts the contribution of ODRs at individual and group levels. These limitations are clearly reflected in most of Argyris' work which mainly focuses on people at managerial level. This study shows that ODRs can be both organizational and individual. These two levels of ODRs are interactive and reinforce each other. This expanded understanding on ODRs moves the focus from specific individuals to organizational context. Organizational context here means that the factors are independent from individual actors. This context is like the soil nurturing ODRs at the individual level. Based on this study, the researcher suggests modifying the definition of ODRs as such:

> *policies and repetitive actions which individuals in organizations collectively apply to prevent themselves from experiencing embarrassment and threat.*

Such an enhanced definition positions ODRs as an organizational issue instead of some specific individuals' flawed behavior. This is better suited to understand the complexity of studying organizational concepts which often contains multiple levels.

Second, this newly developed scale provides a tool for academics to explore the effects of ODRs on other important organizational concepts and build up its nomological network through future empirical works. Thus, academics have more opportunities to gain a more comprehensive view on the role ODRs play in day to day organizational life. When the study tests the predictive validity of the scale of

measuring ODRs, the finding reveals that ODRs are negatively associated with psychological safety. It also negatively affects job satisfaction. The potential of applying the scale to explore the relationship between ODRs and other organizational concepts is far beyond what this thesis covers.

Future studies can further explore the effect of ODRs on other organizational concepts. For example, one concept that could be related to ODRs is organizational commitment. If ODRs exist, employees' opinions to certain organizational issues either are self-censored or neglected by the decision makers. In the long term, employees could feel they are not valued by organizations. As a result, employees' willingness to exert effort towards organizational goals could drop and their desire of maintaining organizational membership tends to reduce. These processes could lead to low organizational commitment (Porter, Steers, Mowday & Boulian, 1974). Empirical evidence on the study of micro-politics, which is one manifestation of ODRs, shows that politics is negatively associated with organizational commitment in general (Cropanzano, Howes, Grandey & Toth, 1997). Another organizational concept which ODRs may have a close relationship with is job performance. Organizations with ODRs are more likely to provide inconsistent and ambiguous feedback to employees' negative outcomes of their performance (Noonan, 2007). Without obtaining clear guidance on their performance, employees are not able to solve difficult issues, but focus on routine procedures which deal with problems at the surface. Additionally, they may not be motivated to reveal their advice on how to improve their performance through streaming existing routines or reducing slack resources, because employees in organizations with ODRs fear to cause embarrassment and threat to themselves or others by challenging the authorities or

the main streams.   Consequently, employees will only produce mediocre performance by sustaining the status quo.

Third, the scale creates an opportunity to bridge practitioners and academics' understanding of ODRs. Previous studies on ODRs are mainly based on consultants' experience.   These studies are beneficial in conceptualizing ODRs, but it is challenging for academics to systematically understand ODRs. This scale can be applied to complement the traditional method practitioners rely on.   With the assistance of the scale, practitioners can gain the initial knowledge of ODRs in organizations before further investigation, or apply it as a tool to confirm their findings.   Hence, it creates a communication channel between practitioners and academics and increases the applications of works in both fields. Last but not the least, this scale benefits organizations of any size, age and types at any stage of their development.   As pointed out previously, ODRs are omnipresent in most of organizations. Due to the obscure characteristics of ODRs, organizations often failed to realize their existence until their damage are deep into the core of organizational issues. By then, it will be arduous for organizations to eliminate them. The scale could be a tool for organizations to self-assess the existence of ODRs, especially when they are going through radical changes and making some crucial decisions, as a seemingly unanimous decision often contains covert differences which could be valuable in decision making. The awareness of ODRs can prevent organizations from making mistakes based on an incomplete picture.

Fourth, the seemingly contradicted findings of the two empirical studies indicate that ODRs may have some positive effect. This positive effect has not been well

discussed in the current literature. However, micro-politics as a relevant concept to ODRs have been praised as "social energy that transforms the insights of individuals and groups into the institutions of an organization" (Lawance, et al., 2005). Meanwhile, micro-politics is also criticized by academics as a detrimental factor to organizational outcomes (Llian, et al., 2015) and employees' job satisfaction (Randall et al., 1999; Breaux et al., 2009; Rosen et al., 2009). Hence, in the same vein, the positive side of ODRs should also not be ignored. There is a benefit of using soft skills to handle negative information in organizations. This could lead to more democratically based and egalitarian types of organizations. Working in this kind of organization, employees tend to have positive emotions (Barge & Oliver, 2003). When social interactions and influence are accounted for in organizational learning, a study found that suppressing some information could enhance organizational learning (Fang et al., 2013). While Barge and Oliver (2003) discuss the benefit of implementing appreciative inquiry, they also pointed out that full appreciation can cause employees to avoid discussing tough and painful information. Additionally, this is also suggested by Fang et al. (2013) that a low level of information distortion could elicit an active explorative process that improves learning abilities, but a high level of ODRs could impede them from identifying the core issues related to a higher level of organizational learning. Top managers should create a climate in which people are not afraid to ask hard questions, and in which people treat failure as an opportunity to learn instead of an embarrassment. Creating this climate benefits organizations to identify errors and correct them in a more efficient manner. This does not mean organizations will be free from ODRs, as it is unrealistic that all the employees speak up about organizational issues with no fear of causing embarrassment and retaliation. Therefore, a low level of ODRs should be

tolerable in organizations. Hence, we can see that certain levels of avoidance of embarrassment and conflict can foster an amicable organizational culture, but it also results in severe information distortion and learning failures.

Finally, this research shows the importance of reflective communication on changing routines. One reason of individual contributing to ODRs is because they automatically assume genuine feedbacks at certain issues could cause embarrassment and threat to themselves or others (Aryris, 1990; Riley et al. 2013). Without reflective talk between employees, problems and alternative actions will emerge (Howard-Grenville, 2005; and Katharina et al. 2016). Employees end up following the established routines which could be inappropriate at the specific time and situation. This indicates that organizations need to encourage individuals reflect on the impact of by-passing and covering up organizational issues. Ultimately, organizations should have a culture to encourage employees to try different new action and embrace failure as opportunities to learn.

7.2.2 Implication on literature of organizational routines

This study contributes to the theory of organizational routines at two facets. First, this study enhances the current understanding of organizational routines. Routines become stable after reinforcement and repetitive usage (Hodgson, 2008). This recurrent and repetitive behavior can reduce time consumption and cognitive burden on solving similar problems resulting in an increased economic scale (Feldman & Pentland, 2003). The point of routines being stable is argued from an economic perspective view. However, this thesis provides a more nuanced view of understanding why employees tend to fall into a habitual behavior of censoring their opinion and sustain this behavior from a social cognitive perspective. The instinctive propensity to resort to defensive routines is a strong element in social integration. Revealing some negative information forthrightly could embarrass the receiver. Especially if the revelation is against dominant way of thinking, the initiator could face being labelled as a troublemaker or be ostracized by the group. Hence, employees carefully weigh the risk against the benefits of speaking up. This results in employees concealing the information or opinion which prevent radical changes with existing routines. This perspective of understanding routines indicates that social cognition should be considered when seeking ways of implementing changes. Second, the findings of this thesis suggest that routines should be understood from multiple levels. Routines rely on humans' carrying out repetitive behaviors, hence individuals' factors should be in consideration. Individuals' factors are the fabric of the collective behavior. This shows that changing routines requires organizations to consider both of the factors.

7.2.3 Implication on literature of organizational learning

The study also contributes to enrich the current theory of organizational learning. The majority of studies in organizational learning focus on its conceptualization and outcome, but this study tries to identify antecedents of organizational learning based on empirical studies. The results indicate that both organizational and individual factors could have a decisive effect on organizational learning. For example, centralization and formalization are negatively related to organizational learning; and openness to experience is positively related to organizational learning. Hence, organizations who want to improve their learning capabilities have to adopt appropriate structures, but also need to implement a rigorous personnel selection. With the satisfaction of these two conditions, it is also necessary to reduce ODRs at a certain level in order to clear away the barriers of organizational learning.

7.3 Conclusion

This thesis first develops a framework which posits that the level of ODRs moderates the relationship between organizational factors (size, age and structure) / individual factors (conscientiousness, openness to experience and neuroticism) and organizational learning. Based on the framework, hypotheses are developed for the subsequent empirical studies. Following the literature review, the researcher explains the research design and her choice of research paradigm. Prior to conducting empirical studies, the researcher develops a scale for measuring ODRs via six individual studies. After testing the reliability and validity of the scale, the researcher was confident to implement the newly developed scale into two empirical studies.

Briefly, the main contributions of this thesis are: 1) a theoretical refinement of ODRs, 2) a scale of ODRs for other researchers to use in future work, and 3) the provision of evidence to show that the effect of ODRs is more nuanced than originally thought. Two empirical studies show that ODRs moderate the relationship between formalization and organizational learning at organizational level, but do not have statistical significant on the relationship between individuals' personality traits and organizational learning.

7.4 Limitations of the Study

The individual chapters have stated the limitations of the respective studies presented in each chapter. This section highlights the main limitations of the studies.

First, one of main limitations of the study is its exclusive use of perceptual measures to study organizational issues. One concern of using individual perceptions is about whether they are able to represent organizations. The research has tried to reduce the limitation by controlling participants' tenure to be over one year in order to increase the reliability of information, though it is inevitable that individuals may have biased views due to their bounded rationality and the extent of involvement with organizations. Due to the research questions and availability of resources, the researcher chooses a self-selection sampling technique to collect data. Based on the available information they provided, the majority of respondents are from different organizations with tenures longer than one year. This means that they should have adequate knowledge about their organizations. Moreover, the survey statements

clearly invite participants to answer questions voluntarily, so if they feel the questions are out of their knowledge, they could drop out anytime.

The second main limitation is about measurement of organizational learning. Organizational learning is a complex concept which researchers have endeavored to apply different principles and different levels to capture the meaning of organizational learning (e.g. Antonacopoulou & Chiva, 2007; Berends & Lammers, 2010; Easterby-Smith, Snell & Gherardi, 1998). Though this enriches the understanding of learning; it simultaneously causes confusion to grasp the determinants of the concept and makes it excruciatingly hard to test it empirically. However, there is a need to systematically test those converged theoretical propositions deduced from qualitative studies and computer simulations (Miner and Mezias, 1996). The research has explored the existing measurements (e.g. Jiménez-Jiménez & Sanz-Valle, 2011; Martínez-León & Martínez-García, 2011; Pérez López et al., 2005; Putz et al., 2012; Tippins & Sohi, 2003). Based on the researcher's knowledge, the most empirically tested measurement is based on the information process model proposed by Huber (1990) and developed by (Pérez López et al., 2004). Hence this scale was chosen for the study. Despite the literature review on the available measures of organizational learning, the researcher is aware of the fact that the measurement may still not be comprehensive enough to reflect this complex phenomenon. Especially, ODRs are often linked with a higher level of organizational learning. Currently, academics suspect that learning can be clearly cut into different levels (Fiol & Lyles, 1985; Miner & Mezias, 1996). All in all, there is a need to carry out more systematic empirical research to further understand learning mechanism in the future.

The third significant limitation of the study is using cross-sectional data. If organizational learning is based on information processes as the literature presented, there should be a change from before and after the new knowledge assimilating into organization and driving changes on behavior. Thus, longitudinal data could yield better internal validity and enable the researcher to make causal claims. However, the emphasis of this thesis is to develop a scale measuring ODRs and to empirically test the new scale. Now the scale has gone through a robust process to establish its validity. Future research can assess causal effects using longitudinal data.

7.5 Recommendation for Future Research

First, a future study should obtain longitudinal data. This study shows that ODRs become more prevalent when organizations are going through changes. Changes often involve adjusting or abandoning the established routine. In an uncertain environment, people are more likely to bypass and cover-up information which could cause a threat to their job security, but this information would be crucial for organizations to make right decisions. The use of longitudinal data, combined with other methods, for instance, agent based modeling would assist researchers to see behavior changes through the learning process. In terms of collecting longitudinal data in the future, the researcher should collect data from organizations before and after significant organizational changes in action in order to get insights into ODRs over time. This procedure would also enable the researcher to check if there are group effects impacting the results before proposing a causal effect exists.

Second, future research could conduct a cross-culture study to compare whether cultural differences can influence ODRs. Existing research on ODRs have not explored this area, but there is a possibility of that organizations operating in countries with high power distance may show a higher level of ODRs than organizations in countries with low power distance. This is because Hofstede (1982) posited that people in a society with high power distance accept hierarchical order. This cultural influence could make people feel it is disrespectable and risky to challenge authorities' decisions. Additionally, Zhang et al. (2014) stated that people with high collectivism tend to apply indirect conflict communication style and a conflict avoidance style. They found that the Chinese group in their study tends to avoid or compromise the conflict in order to save face or save others' in comparison with their American counterparts. Hence, cultural dimensions could affect the level of ODRs to some extent. At least, they can affect types of ODRs they refer to. The future study should endeavor to identify the cultural effect on ODRs.

Third, future work should explore the antecedents of ODRs. The current understanding on ODRs mainly focus on the identifying ODRs and attenuating their damage on organizational learning. Individuals' personality traits could explain why certain individuals are prone to engage in ODRs than others. Though it was not the focus of this study to identify antecedents of ODRs, yet this study showed that neuroticism is positively related to ODRs. This deserves further exploration in the future study. Another antecedent could be leadership styles. Vakola and Bouradas (2005) found that supervisors' attitude towards negative feedback is a strong prediction of organizational silence. This is consistent with Morrison and Milliken's suggestion (2014) that fear of suffering negative consequences and being labelled as

a troublemaker makes employees suppress their disagreements or different opinions in organizations. Change-oriented leaders are willing to appreciate subordinates' perceptions, which gives employees' an impression that there is little risk at raising different opinions (Detert, et al., 2013; Detert & Burris, 2007). Hence, leadership style could be a critical contextual influence on ODRs.

Fourth, it is important to explore the effects of ODRs on both individual and organizations. The current study almost solely focuses on their consequences on organizational learning. More attention is needed on other consequences with an individual focus such as job satisfaction, trust, stress and attitude towards change; or an organizational focus such as decision making and innovation.

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APPENDIX 1: An Item Pool for EFA:

Levels of ODRs	Items
ODRs at organizational level	ODRs1-Most of the time the major decisions in my organization is already made before a meeting actually takes place
	ODRs2- My organization welcomes criticism of its decisions most of the time
	ODRs3- The majority of our meetings last a long time and deal with trivial issues
	ODRs4- Most of my organization's decisions are not influenced by the discussion during meetings
	ODRs5- In my organization, relevant feedback is visible in the decisions made
	ODRs6- Each department just works for its own interest
	ODRs6- Each department just works for its own interest
	ODRs7- Playing it safe seems to be a common activity in my organization
	ODRs8- My organization encourages people to take risks and try different ways of doing things
	ODRs9- Subtle and covert controlling actions are typically taken in my organization
	ODRs10- The causes of negative events are openly discussed in my organization
	ODRs11- Criticism in my organization is encouraged to be given in a subtle way
	ODRs12- My organization has an unspoken norm not to embarrass employees openly
	ODRs13- When things go wrong in my organization, nobody stands up to take responsibility
	ODRs14- My organization has too many rigid rules and regulations
	ODRs15- My organization gives mixed messages
ODRs at individual level	EMB1-I try my best not to embarrass my colleagues
	EMB2- I conceal my real feelings if I think these would embarrass my colleagues
	EMB3- I avoid speaking to the point if this would embarrass my colleagues.
	EMB4- I feel embarrassed if my opinions are challenged by my colleagues
	EMB5- I feel embarrassed to challenge my superiors' opinions
	EMB6- I never dilute bad news to avoid embarrassment for myself or my colleagues
	EMB7- I do not mind confrontation with my supervisor/manager
	EMB8- If I know failure is highly probable, I do not even try in the first place
	RTC2- When dealing with work-related procedures and processes, I do not like changes
	RTC3- In my job, I usually do not change the way I do things
	RTC4- I only change the way of doing things under pressure from the organization
	RTC5-Organisational change makes me feel more insecure about my job
	RTC6- I like exploring different ways of doing my job rather than sticking to certain ways
	RTC7- When dealing with work-related matters, I do not like staying in my "comfort zone"
	RTC8-I am open to challenges of my opinions from colleagues.

APPENDIX 2: EFA Loading

Items:	Factor1	Factor2	Factor3
ODR13:When things go wrong in my organization, nobody stands up to take responsibility.	0.81		
ODR15: My organization gives mixed messages.	0.69		
ODR14:My organization has too many rigid rules and regulations	0.52		
ODR6: Each department just works for its own interest			
ODR3: The majority of our meetings last a long time and deal with trivial issues	0.46		
ODR12: My organization has an unspoken norm not to embarrass employees openly			
ODR5r: In my organization, relevant feedback is visible in the decisions made			
ODR2r: My organization welcomes criticism of its decisions most of the time			
ODR10r: The causes of negative events are openly discussed in my organization			
ODR8r: My organization encourages people to take risks and try different ways of doing things			
ODR11: Criticism in my organization is encouraged to be given in a subtle way.			
ODR7: Playing it safe seems to be a common activity in my organization			0.67
ODR4: Most of my organization's decisions are not influenced by the discussion during meetings			0.61
ODR1: Most of the time the major decisions in my organization are already made before a meeting actually takes place			0.54
ODR9: Subtle and covert controlling actions are typically taken in my organization			0.49

APPENDIX 3: Final Items Organizational Defensive Routines

Organizational Defensive Routines at organizational level

Name of Factors	Items
Organizational cover-up	1: When things go wrong in my organization, nobody stands up to take responsibility.
	2: My organization gives mixed messages.
	3: My organization has too many rigid rules and regulations
	4: The majority of our meetings last a long time and deal with trivial issues
Organizational pretense	5: Playing it safe seems to be a common activity in my organization
	6: Most of my organization's decisions are not influenced by the discussion during meetings
	7: Most of the time the major decisions in my organization are already made before a meeting actually takes place
	8: Subtle and covert controlling actions are typically taken in my organization

The final items for organizational defensive routines at individual level

Name of Factors	Items
Rigidity at Work	When dealing with work-related procedures and processes, I do not like changes
	In my job, I usually do not change the way I do things.
	I only change the way of doing things under pressure from the organization.
Embarrassment Avoidance	I avoid speaking to the point if this would embarrass my colleagues.
	I feel embarrassed if my opinions are challenged by my colleagues
	I feel uncomfortable to challenge my managers' opinions.

APPENDIX 4: Research tool 1 for Exploratory Factor Analysis

BOURNEMOUTH UNIVERSITY

BUSINESS SCHOOL, FACULTY OF MANAGEMENT

OUT OF CONTROL: ORGANIZATIONAL DEFENSIVE ROUTINES

You are being invited to participate in a research study on organizational behavior. The purpose of this research study is to explore elements that relate to the work environment. Judging on previous trial runs, it is estimated that the questionnaire takes approximately six minutes to complete. Your participation in this study is entirely voluntary and you can withdraw at any time. There are no right or wrong answers, so please answer the questions as honestly as possible. Participants remain anonymous and their answers are confidential. This research is part of a PhD research conducted at Bournemouth University and data are only used for this purpose. If you are interested in the results, have questions, suggestions, or comments; please feel free to email Yumei Yang at yangy@bournemouth.ac.uk. Your participation is very much appreciated, thank you very much for your cooperation.

I. This section gathers demographic information of the respondents and the

companies they work

1. What is your gender? ☐ Female ☐ Male

2. What is your age? (   )

3. What is the highest level of education you have completed?

☐ High School
☐ College/Vocational Training
☐ Bachelors Degree & Equivalent
☐ Postgraduate for Master degree
☐ PhD
☐ Professional Qualification
4. Which town/city do you work in? (Please indicate the country if you are not working in the UK) _____

5. What country are you originally from? [List of countries]

6. What is your employment status?

☐ full-time   ☐ Part-time ☐unemployed

7. What is the name of your organization? (optional)

8. How many years has your organization been founded?

☐0-1 year ☐ 2-5 ☐6-10 ☐10-20 ☐21-50 ☐more than 50

9. How long have you been with the organization that currently employs you?

☐ less than a year ☐1-2 ☐ 3-5 ☐6-10 ☐ 11-15   ☐ 16-20   ☐ more than 20 years

10.The organization you work for operates in the:

☐Public sector
☐Private sector
☐Not-for-profit

11. Number of employees in your organization?

☐ up to 10   ☐ 11-50   ☐ 51-500 ☐ more than

12. What is your position in the organization?

☐Staff ☐Supervisory/First Line Manager ☐Middle level Management ☐Senior Level Management

II. This section assesses the items for measuring ODRs at organizational level Think of your place of work and please read and assess each of the following items in terms of how much you agree or disagree on the seven-point scale from 'strongly disagree' to 'strongly agree'. ***Note:*** In the items below "mixed message" means that the messages delivered by the organization are illogical, inconsistent and never up for discussion.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat Agree	Agree	Strongly agree
13. Most of the time the major decisions in my organization are already made before a meeting actually takes place.							
14. My organization welcomes criticism of its decisions most of the time							
15.The majority of our meetings last a long time and deal with trivial issues							
16.Most of my organization's decisions are not influenced by the discussion during meetings							
17.In my organization, relevant feedback is visible in the decisions made							
18.Each department just works for its own interest							

19.Playing it safe seems to be a common activity in my organization						
20.My organization encourages people to take risks and try different ways of doing things						
21.Subtle and covert controlling actions are typically taken in my organization						
22.The causes of negative events are openly discussed in my organization						
23.Criticism in my organization is encouraged to be given in a subtle way						
24.My organization has an unspoken norm not to embarrass employees openly						
25.When things go wrong in my organization, nobody stands up to take responsibility.						
26.My organization has too many rigid rules and regulations						
27.My organization gives mixed messages						

III. This section of the survey assesses items of ODRs in individual level

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
28.I try my best not to embarrass my colleagues							
29.I conceal my real feelings if I think these would embarrass my colleagues.							
30.I avoid speaking to the point if this would embarrass my colleagues.							
31.I feel embarrassed if my opinions are challenged by my colleagues							
32.I feel embarrassed to challenge my superiors' opinions							
33.I never dilute bad news to avoid embarrassment for myself or my colleagues							
34.I do not mind confrontation with my superiors							
35.If I know failure is highly probable, I do not even try in the first place							
36.When dealing with work-related procedures and processes, I do not like changes							
37.In my job, I usually do not change the way I do things							
38.I only change the way of doing things under pressure from the organization							
39.Organisational change makes me feel more insecure about my job.							

40.I like exploring different ways of doing my job rather than sticking to certain ways							
41.When dealing with work-related matters, I do not like staying in my "comfort zone"							
42.I am open to challenges of my opinions from colleagues							

APPENDIX 5: Research Tool 2 for CFA and Empirical Studies

I. This section gathers demographic information of the respondents and the companies they work

1. What is your gender? ☐ Female   ☐ Male

2. What is your age? （   ）

3. What is the highest level of education you have completed?

☐ High School
☐ College/Vocational Training
☐ Bachelors Degree & Equivalent
☐ Postgraduate for Master degree
☐ PhD
☐ Professional Qualification

4. Which town/city do you work in? (Please indicate the country if you are not working in the UK) _____

5. What country are you originally from? [List of countries]

6. What is your employment status?

☐ full-time   ☐ Part-time ☐unemployed

7. What is the name of your organization? (optional)

8. How many years has your organization been founded?

☐0-1 year ☐ 2-5 ☐6-10 ☐10-20 ☐21-50 ☐more than 50

9. How long have you been with the organization that currently employs you?

☐ less than a year ☐1-2 ☐ 3-5 ☐6-10 ☐ 11-15   ☐ 16-20   ☐ more than 20 years

10.The organization you work for operates in the:

☐Public sector
☐Private sector
☐Not-for-profit

11. Number of employees in your organization?

☐ up to 10   ☐ 11-50   ☐ 51-500 ☐ more than

12. What is your position in the organization?

☐Staff ☐Supervisory/First Line Manager ☐Middle level Management ☐Senior manager ☐Executive

II. This section measures organizational defensive routines with the items suggested by EFA. Respondents are asked to rate the level of defensive routines.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat Agree	Agree	Strongly agree
13.Most of the time the major decisions in my organization are already made before a meeting actually takes place.							
14.The majority of our meetings last a long time and deal with trivial issues							
15.Most of my organization's decisions are not influenced by the discussion during meetings							
16.Playing it safe seems to be a common activity in my organization							
17.Subtle and covert controlling actions are typically taken in my organization							
18.When things go wrong in my organization, nobody stands up to take responsibility.							
19.My organisation has too many rigid rules and regulations							
20.My organisation gives mixed messages							

21When dealing with work-related procedures and processes, I do not like changes						
22.In my job, I usually do not change the way I do things.						
23. I only change the way of doing things under pressure from the organization						
24.I avoid speaking to the point if this would embarrass my colleagues.						
25.I feel embarrassed if my opinions are challenged by my colleagues						
26.I feel uncomfortable to challenge my managers' opinions.						

III. This section of the survey is based on the work of (Pérez López et al. 2004). This section asks the respondents to rate the level of organizational learning in their organizations

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
27.The employees attend fairs and exhibitions regularly							
28.There is a consolidated and resourceful R&D policy							
29.New ideas and approaches to work performance are experimented continually							
30.The company has formal mechanisms to guarantee the sharing of best practices among the different fields of activity							
31.There are individuals within the organization who take part in several teams or divisions and who also act as links between them							
32.There are individuals responsible for collecting, assembling and distributing employees' suggestions internally							
33.All the members of the organization share the same aim, to which they feel committed							
34.Employees share knowledge and experience by talking to each other							

Teamwork is a very common practice in the company						
35.The company has directories or emails filed according to the field they belong to, so as to find an expert on a specific issue at any time						
36.The company has up-to-date databases of its clients						
37.There is access to the organization's database and documents through some kind of network(Microsoft SharePoint/Office 365, intranet, etc.)						
38.Databases are always kept up-to-date						

IV. this section of survey is based on Ferrell and Skinner's work (1998). The respondents rate the extent of centralization and formalization in their current organizations.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
39. Any major decision that I make has to have this company's approval.							
40. In my dealings with this company, even quite small matters have to referred to someone higher up for a final answer							
41. My dealings with this company are subject to a lot of rules and procedures stating how various aspects of my job are to be done.							
42. I have to ask company reps before I do almost anything in my business							
43. I can take very little action on my own until this company or its reps approve it							
44.If a written rule does not cover some situation, we make up informal rules for doing things as we go along							
There are many things in my business that are not covered by some formal procedure for doing it							

45. Usually, my contact with my company and its representatives involves doing things "by the rule book"						
46. Contact with my company and its representatives are on a formal preplanned basis						
47. I ignore the rules and reach informal agreements to handle some situations						
48. When rules and procedures exist in my company. They are usually written agreements						

V. This section is based on John and Srivastava 's work (1999). The items measure three personality traits, namely conscientiousness, openness, neuroticism).

	Strongly disagree	Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Agree	Strongly agree
49. Do a thorough job							
50.Can be somewhat careless							
51. Am a reliable worker							
52.Tend to be disorganized							
53.Tend to be lazy							
54.Persevere until the task is finished							
55.Do things efficiently							
56. Am easily distracted							
57. Make plans and follows through with them							
58. Am depressed, blue							
59. Am relaxed, handles stress well							
60. Can be tense							
61. Worry a lot							
62. Am emotionally stable, not easily upset							
63. Can be moody							
64. Remain calm in tense situations							
65. Get nervous easily							
66. Am original, come up with new ideas							
67. Am ingenious, a deep thinker							

68. Am curious about many different things						
69. Have an active imagination						
70. Am inventive						
71. Value artistic, aesthetic experiences						
72. Prefer work that is routine						
73. Like to reflect, play with ideas						
74. Have few artistic interests						
75. Am sophisticated in art, music, or literature						

APPENDIX 6: Research Tool 3 for Discriminant and Convergent Validity Test

I. This section gathers demographic information of the respondents and the

companies they work

1.What is your nationality?

❍ UK (1)

❍ US (2)

❍ Other (33)

2. Please indicate your gender.

	Male (0)	Female (1)
Are you male or female? (1)		

3. Are you currently employed?

❍ Yes, full time (1)

❍ Yes, part time (2)

❍ No (3)

4. In which sector do you work?

❍ Public Sector (1)

❍ Private Sector (2)

❍ Non-Profit Sector (3)

5. How long have you been with the organization that currently employs you (indicate years)?

II This section is based on the newly development scale of ODRs by the researcher. It asks respondents to rate the level of ODRs at their current organizations.

	Strongly disagree	Disagree	Some what disagree	Neither agree nor disagree	Somewhat Agree	Agree	Strongly agree
6. Most of the time the major decisions in my organization are already made before a meeting actually takes place.							
7. The majority of our meetings last a long time and deal with trivial issues							
8.Most of my organization's decisions are not influenced by the discussion during meetings							
9.Playing it safe seems to be a common activity in my organization							
10..Subtle and covert controlling actions are typically taken in my organization							
11.When things go wrong in my organization, nobody stands up to take responsibility.							
12.My organization has too many rigid rules and regulations							
13.My organization gives mixed messages							

14.When dealing with work-related procedures and processes, I do not like changes							
15.In my job, I usually do not change the way I do things.							
16. I only change the way of doing things under pressure from the organization							
17.I avoid speaking to the point if this would embarrass my colleagues.							
18.I feel embarrassed if my opinions are challenged by my colleagues							
19.I feel uncomfortable to challenge my managers' opinions.							

III the section uses a global measure of job satisfaction. The items ask respondent rate how satisfied they are with their current job.

20. Overall, how satisfied or unsatisfied are you with your current job?
❍   Very Dissatisfied (1)
❍   Dissatisfied (2)
❍   Somewhat Dissatisfied (3)
❍   Neutral (4)
❍   Somewhat Satisfied (5)
❍   Satisfied (6)
❍   Very Satisfied (7)

IV The section is based on Brinsfield's work (2013). It asks respondents to indicate the extent to which you typically experience the stated reasons for wanting to remain silent in response to important issues, events, or concerns in your current job.

	Strongly Disagree (1)	Disagree (2)	Somewhat Disagree (3)	Neither Agree nor Disagree (4)	Somewhat Agree (5)	Agree (6)	Strongly Agree (7)
21. I felt it was dangerous to speak up							
22. To protect myself form harm							
23.I felt it was risky to speak up							
24.I believed that speaking up may negatively impact my career							
25.I was afraid of adverse consequences (e.g., being criticized, losing my job)							
26.Due to fear of retaliation							

V. This section based on the work of Bozeman and Feeney (2011). It asks respondents to indicate the extent of red tape in their organizations.

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
27. The employees here are constantly being watched to check for rule violations.					
28. People here feel as though they are constantly being watched to see they obey all the rules.					
29.Please select "Neither Agree nor Disagree" here.					

VI This section is based on Vakola and Bouradas' work (2005). It asks respondents indicate the organizational silence

	Strongly Disagree (1)	Disagree (2)	Neither Agree nor Disagree (3)	Agree (4)	Strongly Agree (5)
30. Top management of the organization encourages employees to express their disagreements regarding company issues.					
31. In this organization, people feel free to express themselves.					
32. If you disagree about issues present in the organization, you can be characterized as troublemaker by the top management					
33. If you express you disagreements regarding issues in the organization, you may suffer negative consequences coming from the top management					
34. If you disagree about issues in the organization, it can be perceived as lack of loyalty by the top management					

Employee Silence Behavior. This is based on the work of Vakola and Bouradas' work (2005) measuring employees' silence behavior.

Please rate how easily you express your disagreements to your managers concerning the following issues? 1=with great difficulty; 7= easily

35. _____ Regarding company issues (1)

36. _____ Regarding my department's issues (2)

37. _____ Regarding my job (3)

APPENDIX 7: Tables for Descriptive Information of the Predictive Validity Test

Descriptive Information of the Predictive Validity Test at Individual Level

	Mean	s.d.	1	2	3	4	5
1. Tenure	10.70	9.39					
2. Gender	0.48	0.50	-0.15				
3. Employ Status	1.25	0.43	-0.21**	0.47**			
4. Sectors	0.44	0.48	-0.09	-0.01	0.07		
5. Job Satisfaction	5.12	1.64	0.03	-0.06	0.06	0.08	
6. iODRs	3.76	1.23	-0.15	0.17*	0.18*	0.03	-0.35**	**0.87**

Note: N=151, Reliability of iODRs is at the diagonal. Public sector is coded as "1" and private sector is coded as "0".

 ** $P < 0.01$; * $P < 0.05$

Descriptive Information about the Predictive Validity Test at Organizational level

	mean	s.d.	1	2	3	4	5	
1. Tenure	10.7	9.39						
2. Gender	0.48	0.50	-0.15					
3. Employ Status	1.25	0.43	-0.21	0.47**				
4. Public Sector	0.44	0.50	0.09	0.00	-0.07			
5. psychological safety	4.31	1.24	0.04	0.09	-0.02	-0.15		
6.OrgODRs	4.14	1.29	-0.01	-0.09	-0.07	0.16*	-0.58**	**0.90**

Note: N=151, Reliability of iODRs is at the diagonal. Public sector is coded as "1" and private sector is coded as "0".
        ** $P < 0.01$; * $P < 0.05$

APPENDIX 8: Glossaries

Organizational defensive routines (ODRs): are actions and policies that prevent individuals or segments of the organization from experiencing embarrassment or threat.

Mixed messages: the messages delivered by the organization are illogical, inconsistent and never up for discussion

Facework: strategies people use to mitigate face threatening or face losing.

Rigidity: individuals playing safe to avoid changes and showing insecure feelings under the support of organizational defensive context.

Embarrassment avoidance: refers to individuals who avoid challenges from other people or challenges to other people in order to prevent embarrassment.

Organizational cover-up: organizations cover-up the existing organizational issues whose exposure could cause embarrassment or threat.

Organizational pretense: that organizations disguise themselves being competent