

A Behavioural Study of Obedience in Health Professional Students

By

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

DOCTOR OF PHILOSOPHY

in

Psychological Studies in Education

Department of Educational Psychology

University of Alberta

ABSTRACT

The research in this dissertation draws on theories from psychology to address the issue of obedience as it relates to medical error and patient harm in healthcare settings by developing a model of obedience, analyzing the environment of application through survey research, and testing obedience in a simulated compliance scenario. The first chapter presents an overview of the dissertation and a review of literature on compliance in healthcare and related topics. In the second chapter a model for obedience is developed drawing on relevant psychological theories. The third chapter reports on survey data gathered to better understand healthcare environments, showing both obedience to authority and conformity are frequently encountered, with Impression Management, Displacement of Responsibility, and Moral Distress being contributing factors. In the fourth chapter to explore causative mechanisms of obedience to authority an experimental simulated compliance scenario was used with Respiratory Therapy and Advanced Care Paramedic students. An intervention to increase positive deviance did not have a significant effect. Low cognitive load reduced the rate of positive deviance in Respiratory Therapy students. The fifth chapter reports on students' experiences during the simulation scenario. Impression Management, Displacement of Responsibility, and Moral Distress were found to be important factors for obedience to authority, aligning with results presented in chapter three. The combined research is an initial step towards a more refined understanding of obedience to authority in healthcare. In Group Loyalty and experience appear to be important factors in determining if a person will engage in positive deviance while Cognitive Load and Respect for Authority did not function as expected. Within the overarching consideration of patient safety, future research, and practical approaches to promoting positive deviance through education are discussed, including a three-step approach that may be integrated into existing curriculum.

PREFACE

The research included in Chapters III-V of this dissertation is composed of two separate research projects conducted by Efrem Violato. A team-based and collaborative approach was taken to both projects with the support of several people. Research ethics approval for the research in Chapter III was granted by the University of Alberta Research Ethics Board 2, Pro00081948. The research in Chapter III was conducted by recruiting participants from departmental listservs at the University of Alberta, and the Help Save Stan Organizing Committee. Research ethics approval for the research in Chapter IV and V was granted by the University of Alberta Research Ethics Board 2, Pro00089450, and the Northern Alberta Institute of Technology Research Ethics Office, Ethics # 2018-15. The research in Chapters IV and V was conducted with the support of the Respiratory Therapy and Advanced Care Paramedic Programs, and the Centre for Advanced Medical Simulation at the Northern Alberta Institute of Technology. The author of this dissertation was instrumental in the identification and design of the research programs, the collection of data and performance of the experiments, analysis of the data, and drafting of the chapters. Authorship and contributions for Chapters II to V are based on the International Committee of Medical Journal Editors (ICMJE) guidelines (International Committee of Medical Journal Editors, 2020). Any errors, mistakes, or flaws in the dissertation are those of the author of the dissertation alone.

Chapter II has been submitted to *the Journal of Interprofessional Education and Practice*; the formatting matches the journal style.

Author contributions:

Efrem Violato: Conceptualizing and design of the work – *planned the paper and developed the theoretical framework*. Acquisition, analysis, and interpretation of the data – *collected and interpreted all literature*. Drafting and revising the manuscript – *drafted the initial manuscript and revised all subsequent versions*.

Sharla King: Conceptualizing and design of the work – *planned the paper*. Drafting and revising the manuscript – *drafted the initial manuscript and revised all subsequent versions*.

Chapter III has been published, the formatting matches the journal style.

Violato, E., King, S., & Bulut, O. (2020). A Multi-Method Exploratory Study of Health Professional Students' Experiences with Compliance Behaviours. *BMC Medical Education*, 20:359, <https://doi.org/10.1186/s12909-020-02265-4>

Author Contributions:

Efrem Violato: Conceptualizing and design of the work – *developed the research questions, the plan and methods for the study and designed the survey used*. Acquisition, analysis, and interpretation of the data – *planned and conducted all data collection, analysis, and interpretation*. Drafting and revising the manuscript – *drafted the initial manuscript and revised all subsequent versions*.

Sharla King: Conceptualizing and design of the work – *developed the research questions and plan for study*. Acquisition, analysis, and interpretation of the data – *planned and conducted data collection and qualitative analysis and interpretation*. Drafting and revising the manuscript – *drafted the initial manuscript and revised subsequent versions*.

Okan Bulut: Conceptualizing and design of the work – *designed the instrument used.*

Acquisition, analysis, and interpretation of the data – *advised on quantitative analysis and interpretation.* Drafting and revising the manuscript – *revised all versions of the manuscript.*

Chapter IV has been published, the formatting matches the journal style.

Violato, E, Witschen, B., Violato, E., & King, S. (2021). A Behavioural Study of Obedience in Health Professional Students. *Advances in Health Sciences Education*.
<https://doi.org/10.1007/s10459-021-10085-4>

Author contributions:

Efrem Violato: Conceptualizing and design of the work – *developed the research questions, the plan and methods for the study, and all materials.* Acquisition, analysis, and interpretation of the data – *planned and conducted all data collection, analysis, and interpretation.* Drafting and revising the manuscript – *drafted the initial manuscript and revised all subsequent versions.*

Brian Witschen: Conceptualizing and design of the work – *developed the plan and methods for the study.* Acquisition, analysis, and interpretation of the data – *planned and conducted all data collection and interpreted the data.* Drafting and revising the manuscript – *revised all versions of the manuscript.*

Emilio Violato: Acquisition, analysis, and interpretation of the data – *conducted data analysis and interpretation of the data.* Drafting and revising the manuscript – *drafted the initial manuscript and revised all versions of the manuscript.*

Sharla King: Conceptualizing and design of the work – *developed the research questions, plan and methods for the study, and all materials*. Acquisition, analysis, and interpretation of the data – *planned data collection and interpreted the data*. Drafting and revising the manuscript – *revised all versions of the manuscript*.

Chapter V has been submitted to the *Journal of Interprofessional Care* and is formatted to match the journal style.

Author contributions:

Efrem Violato: Conceptualizing and design of the work – *developed the research questions, plan and methods for the study, and all materials*. Acquisition, analysis, and interpretation of the data – *planned and conducted all data collection, analysis, and interpretation*. Drafting and revising the manuscript – *drafted the initial manuscript and revised all subsequent versions*.

Brian Witschen: Conceptualizing and design of the work – *developed the plan and methods for the study*. Acquisition, analysis, and interpretation of the data – *planned and conducted all data collection and interpreted the data*. Drafting and revising the manuscript – *revised all versions of the manuscript*.

Emilio Violato: Acquisition, analysis, and interpretation of the data – *conducted data analysis and interpretation of the data*. Drafting and revising the manuscript – *drafted the initial manuscript and revised all versions of the manuscript*.

Sharla King: Conceptualizing and design of the work – *developed the research questions, plan and methods for the study, and all materials*. Acquisition, analysis, and interpretation

of the data – *planned data collection and interpreted the data*. Drafting and revising the manuscript – *revised all versions of the manuscript*.

DEDICATION

Dedica ai miei nonni per tutti i loro sacrifici e il loro duro lavoro che mi ha dato l'opportunità di realizzare questo. Una laurea è niente rispetto a ciò che loro hanno fatto.

ACKNOWLEDGMENTS

Thank you to Dr. Sharla King for her supervision of my research and this dissertation and providing many opportunities, encouragement, and the chance to do lots of interesting work throughout my degree.

Thank you to my supervisory committee Dr. Jonathan Duff and Dr. Veronica Smith for their advisement.

Thank you to Dr. George Buck and Dr. Elaine Gilfoyle of my examining committee for providing an enjoyable defense and to Dr. Mark Gierl for chairing the defense.

Thank you to my parents for their love and support.

Thank you to my wife, Christiana Manzocco, for putting up with me.

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CHAPTER I: INTRODUCTION

This dissertation is a collection of a theoretical paper, a survey study, an experimental study, and a multi-method study based on two research projects examining compliance behaviour in health professional students. The collected studies utilize multiple methods including survey, experimental, qualitative, and machine learning methods and is grounded in a foundation of psychological theory. This research aims to add to a growing body of research seeking to understand how compliance functions in healthcare teams and can result in patient harm. Causes of patient harm in general, and compliance as an aspect of patient harm, is broad and complex. Focusing on subsets of each cause of patient harm can help reduce medical errors and patient harm through an incremental approach that addresses the cause of harm, such as standardized prescription writing to reduce medication error (Kohn et al., 1999, p. 37-40). This dissertation aims to contribute to the process of reducing patient harm by focusing on one aspect of harm: negative compliance elicited through obedience to authority among health professional students. As such, a theory and model of obedience to authority was developed, data were collected, and the data were used to review the initial model with implications for practice, research, and education.

Background and Literature Review

In this first chapter, literature is reviewed on patient safety and compliance in healthcare, psychology and theory, interprofessional education and collaboration, training focused on the individual, and students and multiple professions as essential team members. Based on the reviewed literature, a statement of the problem and research questions are established.

Patient Safety & Compliance

Medical error and harm are complex with multiple causes at numerous levels of healthcare systems (Kohn et al., 1999). Iatrogenic causes are estimated to be the third leading cause of death in the United States (Makary & Daniel, 2016), and Canada (RiskAnalytica & Canadian Patient Safety Institute, 2017). In Canada, 1 in 18 hospital patients experience harm (Canadian Institute for Health Information, 2019; Vogel, 2016); in other high-income countries it is estimated 1 in 10 patients experience harm with higher rates observed globally, where 4 in 10 patients experience harm (Slawomirski et al., 2018). It is estimated between 50-80% of cases of patient harm are preventable (World Health Organization, 2020); however, the causes of harm are broad, and each cause needs to be addressed to reduce the harm that can occur to patients (Kohn et al., 1999).

Negative compliance is one threat to patient safety that can produce harm. Negative compliance in healthcare settings is defined as deference, yielding, or complying with others, characterized by a lack of effectively engaging in action to prevent harm by speaking up or altering a course of action believed to be inaccurate or unsafe (Delaloye, 2017; Green et al., 2017). Succinctly, compliance can be understood through conformity and obedience to authority. Conformity refers to the act of changing one's behaviour to match the responses of others, while obedience to authority is behaving in accordance with the opinions, advice, and directives of authority figures (Cialdini & Goldstein, 2004). Both conformity and obedience are social heuristics (Bocchiaro & Zimbardo, 2017; Cialdini & Goldstein, 2004). Social heuristics are generalized automatic responses based on decision making strategies that are typically advantageous and successful for daily social interactions. Social heuristics are utilized to shift behaviour to what is most advantageous when time, cognitive resources, or environmental information is scarce (Rand et al., 2014). Negative outcomes produced through compliance are

contrasted by positive deviance. Positive deviance (PD) is taking effective action to counter negative outcomes any time a person observes behaviour that may put a patient at harm or erodes professional values. Positive deviance often must occur in the face of norms or social and personal pressures that make it difficult to engage in the counter action (Blanton & Christie, 2003; Holmes et al., 2014). Often, though not always, PD occurs through speaking up or challenging authority (Pattni et al., 2019). Negative compliance and PD are interpersonal interactions where the social aspect is accompanied by environmental and individual factors (Bandura, 1999, 2001). For example, during World War II, the German Reserve Police Battalion 101 was a paramilitary formation under command of the SS. While deployed in Poland in 1942-43, the group killed approximately 83,000 Jews. When the Battalion arrived in Poland, the Commander informed the men that he had received an order (Displacement of Responsibility) that they would be killing Jews. Although the Commander stated he did not personally like the idea, it was an order (social factor – identification with a superior) but anyone could leave if they did not feel capable. Of 486 men, only 10-12 left. The men were part of a cohesive paramilitary unit; many indicated they did not leave because they did not want to “dodge the dirty work” and appear to be “cowards” or “weak” in front of their comrades (social factors - conformity as an overlay for obedience). Most of the men also bore anti-Semitic attitudes and a hatred of Jews and had been told to think of loved ones at home that had been killed (individual factors). The actions also occurred in a foreign country, an unfamiliar non-normative place, during war (environmental factors) (Richardot, 2014).

In healthcare, there is a need for continued improvement of patient safety and the development of new methods and paradigms to reduce harm (Cohen & Patel, 2020). Frequently, in the healthcare literature negative compliance is seen as a moral failing, a lack of analytical

thinking, or blind adherence, a problem of rationality (Srivastava, 2013; Wang et al., 2018; Wellbery, 2011). Approaching the problem of compliance as a problem of rationality is inadequate for understanding the issue and developing methods to prevent negative compliance. The evidence shows implementing analytical thinking is challenging; people tend to believe they are not susceptible to risk factors (Abed et al., 2015) and will behave better than the average even after being given knowledge about flaws in cognition and behaviour (Zell et al., 2019). People also believe they will not be susceptible to motivational biases (Scopelliti et al., 2015) or compliance (Grzyb & Dolinski, 2017). Expertise is not a protective factor against social, cognitive, and moral errors and does not support generalized cognition (Ariely, 2008; Jena et al., 2018; Nickerson, 2007; Redelmeier et al., 2001; Schwitzgebel, 2009; Shafir & Leboeuf, 2002).

Compliance in Healthcare Presently, there is a growing body of research on hierarchies in healthcare, barriers to speaking up, and interventions for speaking up and improving team functioning, including for students in the health professions (Blenkinsopp et al., 2019; Kilpatrick et al., 2020; Mannion et al., 2018; Milligan et al., 2017; O'Donovan & McAuliffe, 2020; Pattni et al., 2019; Peadon et al., 2020). While the term is not explicitly used in the healthcare literature, the issues explored in this research relate to the notion of 'obedience to authority' (Cassell, 2005).

Healthcare is hierarchical, and those in leadership or advanced hierarchical positions can exert influence over others. Ideally, authorities have a positive impact, such as providing expertise and order in a crisis. However, authorities can have a negative impact, such as when an inappropriate directive is given, and people do not feel empowered to speak up, resulting in patient harm (Calhoun et al., 2014). Recent survey studies have indicated the majority of health professional students regularly observe lapses in professionalism, safety concerns, and errors by

peers and staff. Students indicate they do not speak up due to a lack of knowledge in how to respond, professional cultures that make speaking up seem futile, and concerns for, and fear of, conflict (Mak-van der Vossen et al., 2018; Martinez et al., 2017; Schwappach et al., 2019; Schwappach & Sendlhofer, 2020).

Mitigating patient harm caused by negative compliance enacted by obedience to authority requires understanding how different factors facilitate or prevent obedience, including educational interventions. Often obedience is understood as blind or tacit acceptance of power that permeates socially constructed hierarchies enacted and maintained by people with a will to power and domination (Moosa & UD-Dean, 2011). Rather, hierarchies and obedience are adaptive strategies that allow for social functioning (Zitek & Tiedens, 2012). Despite the emergent research, outside of the general identification of the problem and discussion of hierarchies and power, there is a lack of evidence for causative mechanisms of negative compliance and PD with pre-licensure students working in teams (Milligan et al., 2017; Peadon et al., 2020). Without a complete understanding of why obedience occurs during human interactions, it is impossible to encourage people to engage in PD. To better understand negative compliance and obedience to authority, it is necessary to look at the existing research specific to obedience and PD/speaking up, teamwork and collaboration, and the different professions comprising healthcare teams.

Psychology and Theory Outside of a minority of studies, research on obedience to authority and conformity in healthcare is not approached using psychological theory or discussed using terms from psychology. Some of the research touches on basic principles, but the full incorporation of a guiding theory is rare. The lack of incorporation of psychological research is surprising considering the applicability of psychology, including research on obedience, has been acknowledged in the literature (Cassell, 2005). In 1966, Hofling and colleagues published a study of obedience in nurses. It was found that when a physician asked a nurse to administer an unfamiliar drug at an inappropriate dose in a manner that did not follow the proper protocol, twenty-one out of twenty-two nurses would have followed through with the dosing. In a replication of Hofling et al. (1966), Rank and Jacobson (1977) used a familiar drug in a setting where the nurse had peer contact. In this study, twelve of eighteen nurses obtained the drug; however, only two attempted to administer the drug while the other ten attempted to double-check the dosage and order. Both studies had a psychological theoretical framework and interpretation, primarily psychodynamic theory. The discrepancy between the two studies demonstrates the influence of ambiguity, lack of knowledge, and social isolation in potentiating obedience to authority.

Until recently, there has been a paucity of research on the psychology of compliance and medical errors (Beran, et al., 2014; Kaba et al., 2016). Research conducted by Beran et al. (2013; 2015), and Kaba & Beran (2016) thoroughly integrated psychological theory in their work, adopting the paradigm of conformity research established by Solomon Asch (1951) to examine how the influence of group pressure and social proof can produce conformity and inaccurate conclusions and decisions. Beran et al. (2013) used a knee arthrocentesis simulation to examine the behavioural influence of conformity in medical students. Two conditions were used, a knee

model displaying prior inaccurate puncture sites and a “clean” knee model. In the inaccurate puncture condition, medical students made significantly more inaccurate insertions compared to those in the “clean” knee model condition. In another experimental design study with a synchronous group online learning event, medical students were placed in groups of four and asked basic knowledge questions (Beran et al., 2015). The participants in the experimental condition were able to see group members’ responses versus a control condition where responses were masked. In the experimental condition, participants were placed in a group with three confederates. Participants were always the third group member to respond to a question. Confederates would answer some questions correctly and others incorrectly. Participants had significantly fewer correct responses in the experimental condition. Kaba and Beran (2016) investigated medical and nursing students reporting of vital signs taken from a patient simulator. Participants were placed in a group with three confederates with participants placed in the third response position, and three rounds of taking vital signs assessment were conducted. On the first two rounds, confederates accurately reported vital signs while on the third-round confederates reported inaccurate vital signs. It was found nursing students reported inaccurate vital signs at a significantly higher rate than medical students. Asch (1955) identified conformity as a universal influence for two reasons. First is the individual need for belonging gained through group membership, and second is the group need to minimize conflict and promote cohesion and organization in the group (Asch, 1955). The authors interpreted students’ behaviour in these studies in the context of conformity and group dynamics established by Asch (1955). In the three studies the pressures of conformity had a negative behavioural influence on procedural accuracy, knowledge tests, and the reporting of vital signs.

In a theoretical paper, Holmes et al. (2014) approached compliance through a social and cognitive psychology framework, drawing on theories of cultural development and deviance regulation to develop a theory for increasing PD. Despite this work, much of the PD literature is atheoretical (Peadon et al., 2020) and is comprised of self-report surveys (Pattni et al., 2019) where the frequencies of obedience are measured, and factors for obedience, such as individual differences, are not fully integrated into the hypothesis or interpretation of the results. Rather, most studies simply measure a variable, for example self-efficacy, and report if the variable was significantly associated with behaviour.

Simulation Research. Simulation learning is a pedagogical method that, in addition to didactic and demonstration techniques, is an essential part of health sciences education (Palaganas et al., 2014). Most simply, simulation is the practice of skills in a setting that mimics real-world scenarios (Small et al., 1999). Simulation has been used extensively in healthcare and is “experimental healthcare that never puts patients at risk” (Center for Medical Simulation, n.d.). Simulation training has applications beyond teaching technical skills; interprofessional simulations can help healthcare students and professionals understand overlapping roles and increase team effectiveness (Kenaszchuk et al., 2011). Although simulation is often cited as a limitation for generalizability (Peadon et al., 2020), laboratory-based study has been shown to have good external validity with comparable effect sizes to “field-based” research (Anderson et al., 1999). Several researchers have utilized simulated compliance scenarios and experimental designs to study the effect of obedience to authority on medical errors in team settings, yet this history is brief and experimental studies comprise a minority of the PD literature.

One of the first studies to examine challenging authority in a simulation scenario was Pian-Smith and colleagues in 2009 (Friedman et al., 2015). Anesthesiology residents entered

various simulation scenarios where there was the opportunity to challenge a senior anesthesiologist, a surgeon, or a nurse. The opportunities to challenge came after a relatively contraindicated request, action, or behaviour related to medication administration and optimal procedures. The type of challenge from no-challenge and obtuse, “*Really?*”, to crisp advocacy-inquiry, “*I’m wondering about risks of doing this when there’s a low platelet count. How do you decide how to proceed?*” (Pian-Smith, et al., 2009, p. 87), was assessed. After the simulation, participants were debriefed and given instruction and the opportunity to practice the two-challenge rule¹. If an adequate response is not obtained after two such questions the person should act. After instruction on the two-challenge rule, participants then completed another scenario. The use of advocacy-inquiry towards the anesthesiologist and surgeons significantly increased in the second simulation scenario, but no change was found towards nurses. Although participants were informed the second scenario would offer the opportunity to practice, challenging the behaviour was not pervasive, with 10-20%, based on condition, making no challenge. In a simulation scenario, Calhoun et al. (2013) replicated a real case of medical error. In the simulation with a multidisciplinary team of pediatric intensive care unit clinicians, a patient experienced hyperkalemic dysrhythmia and incidental hypophosphatemia. A team leader (confederate) would recommend administering potassium phosphate, which would likely result in death. In the study three separate simulations were run, with two participants in each simulation. The simulations used two different patient case stems, neuroblastoma, and renal

¹ The two-challenge rule originated in aviation and allows a crew member to assume control when another crew member does not respond to two consecutive challenges. The two-challenge rule has been adapted for healthcare through collaborative communication techniques based on advocacy and inquiry approaches. Advocacy is a statement that describes a person’s opinion or position, and Inquiry is a question framed as a genuine request about another person’s thoughts, for example “*I see that you plan to administer a spinal anesthetic to this patient. She has a platelet count of 80,000. I learned that we shouldn’t do a spinal unless the count was at least 100,000. Can you clarify your view?*” (Pian-Smith et al., 2009). Instruction on use of the two-challenge rules is not uniform and variations exist, such as where the first challenge may be based on an advocacy-inquiry approach and the second challenge will be more direct and forceful (Calhoun, et al., 2013).

failure, to meet the learning needs of the clinician groups. Regardless of the stem, the case proceeded in a similar manner. For each case there was a specific point for a challenge, the recommendation to administer potassium phosphate. Across the three simulations the direction to administer the inappropriate drug was successfully challenged twice, once where the challenge was made promptly by a charge nurse, and a second time where there was a delayed challenge by a resident physician leader that was successful; however, the delay impeded appropriate management of the patient's condition. The third time there was no challenge, and the simulated patient died. In a variation of Calhoun et al. (2013), Calhoun et al. (2014) designed a simulation to pilot a method for developing simulations to replicate a critical event attributable to a failure to make a challenge. The scenario was an interprofessional paediatric ICU case where a patient presented with narrow complex supraventricular tachycardia (SVT) and mild hypotension. During the scenario a confederate physician misdiagnosed the heart rhythm a ventricular tachycardia and recommended administering amiodarone through fast IV push, a potentially dangerous action. The simulation included several branching scenarios based on potential successful or unsuccessful challenges to the drug and the method of administration at different points. During the scenario two direct challenges to the confederate about the incorrect order was considered a success. Four out of five teams were unsuccessful in addressing the error. Teams were also assessed on Team Performance During Simulated Crises Instrument (TPDSCI) and Crew Resource Management skills. The team that made a successful challenge performed substantially better on both measures than unsuccessful teams with unsuccessful teams tending to "self-over-appraise" (Calhoun et al., 2014). Sydor et al. (2013) examined differences in hierarchically structured versus non-hierarchically structured interprofessional operating teams. The scenario involved an elective planned bowel cancer resection in a 60-year-old patient with

anemia. Participants were comprised of anaesthesia trainees ranging from program years 2-5 of a five-year program. Prior to the scenario, all participants read a pre-operative order that the patient was a Jehovah's Witness and had strictly refused all blood products. During the scenario the patient showed severe anemia and the anesthetist ordered blood from a blood bank, because not administering a blood transfusion would lead to a worsening of the patient's condition. When the blood arrived, the anesthetist asked participants to check and administer the blood. No difference was found in the challenges to authority in hierarchically structured operating teams compared with non-hierarchically structured operating teams. Most participants gave blood to the Jehovah's Witness patient despite reading the pre-operative order that the patient refused a blood transfusion. Advocacy-inquiry responses improved with program year, and no effects for participant gender were found. Bould et al. (2015) took a qualitative approach to analyze the Sydor et al. (2013) study. Participants gave several different reasons for compliance: real and perceived hierarchy and implicit boundaries, operating room culture, diffusion or Displacement of Responsibility, and conflict avoidance. In an examination of communication styles in an airway management scenario, different communication styles used by a doctor, open/inclusive versus strict/exclusive, did not affect the rate of residents speaking up (Friedman et al., 2015). Similar to Bould et al. (2015), Friedman et al. (2015) found that team members may displace responsibility such that they feel less responsible and become "agents of their leader."

In contrast to Friedman et al. (2015) where communication style did not affect speaking up, in a simulated surgical scenario, Barzallo Salazar et al. (2014) found medical students were more likely to speak up about an incorrect procedure when a senior surgeon greeted them with a phrase that encouraged speaking up versus one that discouraged speaking up. Demographic influences and personality traits did not have an effect on speaking up (Barzallo Salazar et al.,

2014). Pattni et al. (2017) found that the gender of an anesthetist influenced Respiratory Therapist's (RT) ability to speak up. Practicing RTs made significantly more challenges towards female anesthetists in a "can't-intubate can't-oxygenate" scenario than towards male anesthetists. No main effect or interactions were found for the gender of the RT.

The Calhoun et al. (2013; 2014), Bould et al. (2015), Sydor et al. (2013), and Pattni et al. (2017) studies did not significantly incorporate any guiding theory to the research design and interpretation besides the existence of power differentials in hierarchical structures. Interestingly, in the Bould et al. (2015) study, participants had positive perceptions of authority and hierarchy. The positive perceptions included always having someone in charge of the situation and that the people most senior in the hierarchy are the most experienced and knowledgeable. Friedman et al. (2015) attempted to develop "Sociological Fidelity" for the simulation scripts, though they failed to identify any useful frameworks in sociology or psychology. In a study reminiscent of Hofling et al. (1966) and Calhoun et al. (2014), Delaloye et al. (2017) found fifty percent of participants in an Interprofessional Collaborative (IPC) simulated scenario delivered an incorrect dosage of a drug via an incorrect method based on the advice of an authority who was not a part of the interprofessional team. The findings were interpreted based on power differentials in hierarchies and the need for methods to speak up, such as the "two challenge rule" (Pian-Smith et al., 2009) to mitigate potential errors. In further qualitative analysis, a systems perspective was taken to understand the different influences on deference, including obedience. Six factors with dynamic and complex interconnected relationships were identified through which healthcare professionals demonstrate obedience, as well as conformity, compromise, and rejection. The six factors include Motivation (e.g. conflict avoidance, needs of patient), Cognition (deliberate, instinctive), Outside the room (hierarchies, culture), Inside the Room (e.g. team, patient, environment),

Mental State and Experience (e.g. cognitive load, ambiguity), and Individual Characteristics (e.g. personality, experience). Deference was identified as having both positive and negative outcomes, though negative outcomes were often unacknowledged by participants (Delaloye, 2017).

Research into PD and speaking up in healthcare is burgeoning. While this work deals with issues of compliance, it is not understood in the terms of obedience and conformity as used in psychology. There is a lack of integration of relevant theories from psychology that could help to inform and accelerate the research that is being conducted. While constructs related to obedience, such as Displacement of Responsibility, often arise, there is a lack of interpretation or relation back to the relevant psychological theories. Most often aspects of psychological theory are integrated in the research through different measures to assess individual differences.

Individual Differences. The influence of individual differences on speaking up has been examined to varying extents. Kobayashi et al. (2006) found that cultural differences between Japanese and American residents were likely less influential on speaking up than professional culture. In contrast, the influence of hierarchies in Korean national culture was found to supersede educational interventions that attempt to change the professional culture (Roh et al., 2015). Weiss et al. (2014) examined speaking up in physician-nurse dyads from the position of group dynamics and interindividual differences. The authors found trait differences influenced speaking up where those higher in self-perceived agency were more likely to speak up, and those higher in communion were less likely to do so. Barzallo Salazar et al. (2014) investigated cognitive and personality differences through two scales, the General Decision-Making scale and the Self-Construal scale, a measure designed to assess self-image based on interdependent and individual factors. No background on the potential influence on behaviour of General Decision-

Making and Self-Constraint was given or discussion about why the traits were not influential. Likewise, Sydor et al. (2013) examined personality differences measured through the Big Five personality traits and found no relationship with participant behaviour. Psychological safety and self-efficacy have been found to positively predict physicians and nurses speaking up in simulated scenarios, additionally when peers made a mistake or instructions were unclear, females and older participants were more likely to speak up (Roussin et al., 2018). Daly Guris et al. (2019) examined self-efficacy for speaking up, finding that repeated simulation and assertiveness training on speaking up increased student self-efficacy. Effects of cognitive load were also examined, though no effect was found. Contrasting with Daly Guris et al. (2019), Oner et al. (2018) found variable effects for assertiveness training. The benefits of training depended on the primary area of care; Postpartum nurses benefited more from training than Labour and Delivery nurses. Shanks et al. (2020) found training with a Standardized Patient (SP) that cued a necessary challenge did not improve self-confidence in speaking up. Finally, Kuo et al. (2020) examined the rate of reporting medication error after training using a problem-based scenario combined with a two-hour medication administration simulation. Participants in the problem-based learning condition reported errors at a higher rate than those in the control condition. Of these studies, only Weiss (2014) and Kuo (2020) incorporated a guiding theoretical position. Weiss (2014) integrated theory from group dynamics and personality psychology, while Kuo (2020) indicated the problem-based learning intervention was informed by Kolb's Experiential Learning Theory. Kuo (2020) did not go into detail about how the theory was incorporated in the design of the intervention or study. Studies measuring the influence of self-efficacy on speaking up did not detail how self-efficacy influenced behaviour or how the interventions acted as a mechanism of change in self-efficacy. Additionally, Kuo (2020) and Shanks (2020) did not

require participants to challenge an authority directly but only report a medication error. Finally, Barzallo-Salazar et al. (2014) examined two personality traits but did not incorporate any theoretical background or explanation for these traits' influence.

Several aspects of individual differences, including personality traits and self-efficacy, have been examined in the literature. However, the approach to measuring the differences is inconsistent, integration of the relevant theories is lacking, and measures are often used without explanation or interpretation. Other potentially important variables including Cognitive Load and Moral Distress are also under-investigated.

Cognitive Load. Cognitive Load Theory (CLT) is a leading model in educational psychology, generalizable across domains (Szulewski et al., 2021). Cognitive Load Theory is grounded in evolutionary psychology, categorizing knowledge into two sets of knowledge, biologically primary knowledge and biologically secondary knowledge or skills. Biologically primary knowledge is knowledge necessary for survival and social functioning that does not need to be instructed, for example acquiring language or problem-solving using means-end analysis, the consideration of obstacles that stand between the initial problem state and the goal state (Newell & Simon, 1972). Biologically secondary knowledge and skills are things developed later in evolutionary history that are not essential to survival, for example written language or algebra. Biologically secondary knowledge and skills tend to require greater cognitive effort to learn (Geary, 2008; Tricot & Sweller, 2014). Most simply, humans have a limited capacity to process information from the sensory system. Information is processed in the finite Working Memory (WM) and can then be transferred to the theoretically infinite Long-Term Memory (LTM), as well as called up from LTM. Cognitive load can be divided into intrinsic cognitive load (the complexity of relevant information), extrinsic cognitive load (irrelevant information or

noise) and germane cognitive load (WM resources dedicated to processing information). Each form of cognitive load taxes humans limited cognitive capacities and as one form of cognitive load increases it becomes more challenging to process information (Sweller, 2010).

Cognitive load is one of many variables beyond the effects of team structure and gender that may influence obedience. The influence and importance of cognitive load for education and practice have recently gained greater attention in the healthcare literature (Szulewski et al., 2021; Young et al., 2014, 2020). In compliance research, cognitive load is a long-standing under-investigated factor for which the influences are unclear (Baker, 2019; Baron et al. 1996). Cognitive load may be particularly important for compliance scenarios in healthcare where numerous external stimuli can increase cognitive load (Burgess, 2010; Sewell et al., 2020). If people are experiencing high levels of cognitive load, it may be difficult, or impossible, to access adaptive structures or tools for speaking up as automatic and effortful modes of processing are interrupted and situational awareness is reduced (Elfering et al., 2015; Grzyb et al., 2018; Sitterding et al., 2014). Delaloye (2017) found deference to authority to be a way to manage cognitive load and allow for practitioners to focus on a single task.

Moral Distress. When people do not speak up or are unable to speak up due to various obstacles including organizational, interpersonal, and personal factors, psychological distress piqued by the moral implications of the situation can result (Fourie, 2015). Moral Distress and the attendant personal and professional moral beliefs have primarily been investigated in the field of nursing though awareness is starting to spread to other areas such as medicine (Jameton, 2017). Outside of healthcare the related concept of Moral Injury exists, particularly in relation to the military, with a Moral Injury Even Scale having been developed for use in military populations (Plouffe, et al., 2021). The Moral Distress that results from not speaking up, among

other factors, can increase psychological and physiological stress, reduce compassion and job satisfaction and lead to burnout. Moral Distress is exacerbated by a poor ethical climate and attenuated by psychological empowerment (Ford, 2019; Lamiani et al., 2017). To the authors knowledge, Moral Distress has not been examined in the context of experimental studies on speaking up.

Summary Although the incorporation of psychological theory is rare, the existing research is beginning to establish knowledge around obedience to authority. The use of experiments and simulation has accrued evidence that interventions for promoting PD, such as assertiveness training, training in IPC, improving communication skills, and removing hierarchical structures, do not always have a mitigating effect on obedience. Individual characteristics, including self-efficacy, agency, and perceived psychological safety, can support PD, however the further expansion of the research on individual characteristics is needed. Based on the group nature of obedience, it is important to consider the context of teams and collaborative practice.

Interprofessional Education and Collaborative Practice One of the proposed means to enhance patient safety is improved collaborative practice or teamwork, most prominently through interprofessional education and collaborative practice (IPECP) (Cosby, 2017; Institute of Medicine, 2015; Khalili et al., 2019a). Interprofessional education and collaborative practice defines the entire field of study encompassing interprofessional education (IPE) and interprofessional collaborative practice (IPCP) (Khalili et al., 2019a)². Interprofessional

² IPE and IPCP are complex; the Global network for Interprofessional Education and Collaborative Practice Research defines IPCP as “when multiple health workers from different professional backgrounds provide comprehensive services by working with patients, their families, carers and communities to deliver the highest quality of care across settings” (Khalili, et al., 2019a). The Canadian Interprofessional Health Collaborative defines interprofessional collaboration as “the process of developing and maintaining effective interprofessional working

education and collaborative practice is a potential and plausible route to improving patient's healthcare experience (Khalili et al., 2019b), yet to date, research on IPECP has been criticized for being atheoretical, lacking rigour and objectivity, requiring much improvement, and not demonstrating clear benefit (Khalili, et al., 2019b; Paradis & Whitehead, 2018). Further, with the growing focus on IPECP there is the potential for negative aspects of group dynamics to produce patient harm (Kaba et al., 2016). In collaborative practice, the forces of compliance can influence any member of a group. In settings with potentially multiple practitioners of various levels of training, including students, those lower in the hierarchical ordering of the group are more likely to be susceptible to forces of compliance (Fagan et al., 2016; Price et al., 2014; Schwappach et al., 2019).

The Sydor et al. (2013), Bould et al. (2015), and Friedman et al. (2015) studies exemplify the need to examine assumptions about teams empirically. Hierarchies as an entity in and of themselves are often perceived to be the primary barrier for PD and speaking up, yet in the Sydor et al. (2013) and Bould et al. (2015) studies where hierarchies were removed, and in Friedman et al. (2015) where an inclusive communication style was utilized, the rate at which challenges occurred was not impacted. Although these are only three studies, the absence of an effect of flattening hierarchies indicates assumptions about behaviour, and people's explanation for behaviour may be inaccurate. Additionally, Pattni et al. (2017), Weiss et al. (2014), and Roussin et al. (2018) all showed individual differences play a role in speaking up.

relationships with learners, practitioners, patients/clients/families and communities to enable optimal health outcomes. Elements of collaboration include respect, trust, shared decision making, and partnerships (Canadian Interprofessional Health Collaborative, 2010. Interprofessional education (IPE), is “when members or students of two or more professions learn about, with and from each other, to improve collaboration, and the quality of care and services in the process of preparing people for collaborative practice” (Khalili, et al., 2019a). IPECP is more frequently being incorporated into health professional education and models of practice (Khalili, et al., 2019a). For the purposes of this dissertation IPECP is contextualized, understood and commensurate with broad and general definitions of teamwork rather than refined, specific or subtle aspects of IPE, IPCP and IPECP.

Impression Management is another factor that may be highly important for individual's behaviour in healthcare groups or teams, including interprofessionally (Lewin & Reeves, 2011). Impression Management involves people's self-presentation and how self-presentation is modulated based on context (Goffman, 1956). People's efforts to create a preferred self identity and a desired social identity has been proposed as one of the primary driving factors in obedience paradigms, however it has been under researched (Collins & Ma, 2000). This body of work suggests that compliance and PD are much deeper and multifaceted than simple power structures based on hierarchy. Testing assumptions and common knowledge with rigorous methods, including simulation, can improve the quality of research and make it possible to understand better both the positives and negatives of teamwork and IPECP. While it is important to understand group functioning, it is also important to look at the individual in practice and training.

IPECP Training Focused on the Individual A primary focus to the present time has been on creating better functioning teams; however, changing groups, contexts, and disparate components of systems can be exceedingly challenging (Habersang et al., 2019). To date, the results of approaches to improving PD have been variable (O'Donovan & McAuliffe, 2020), and new approaches to the issue of patient safety are needed (Cohen & Patel, 2020). Improving team functioning by shifting the focus from the group level for IPE and team training of early and pre-licensure learners to the level of the individual may be useful (Bainbridge & Regehr, 2015; Holmes et al., 2014). Shifting to preparing individuals for teamwork and understanding how individual differences influence behaviour in teams can potentially be a more efficient and effective approach. Individual traits can facilitate compliance or possibly be leveraged to enhance PD (Holmes et al., 2014). As an example, individuals holding Protected Values that

align with prosocial behaviour (e.g., compromising personal integrity for money is unacceptable) and scoring high on Honesty-Humility have been found to be resistant to professional and national cultural norms that support corruption and de-value prosocial behaviour (Linder et al., 2021).

Shifting the focus to the individual also has the cognitive advantage for researchers, administrators, and instructors alike of moving from the level of statistical interpretation to identifiable individuals. The unit parts of groups and systems become data points, posing a cognitive challenge for engaging the problem. Shifting the focus to the individual increases affective concern about the problem and makes the problem easier to engage. Changing an entire system and the people in it is a nearly intractable problem. Dealing with global level problems can seem insurmountable and actions a “drop in the bucket”; however, individual problems can be solved (Lee & Feeley, 2016; Small & Loewenstein, 2003). Training individuals to be better gives administrators and instructors a problem that can be solved. Improving knowledge about individuals' performance may also have the subsequent effect of supporting training at the team or group level. The better the individual collaborator, the easier it will be to improve the group. To further understand the group and the individual, it is important to consider that many professions can make up interprofessional teams.

Students and Multiple Professions as Essential Team Members The patient-centered team is often made up of diverse professionals, yet most of the research related to compliance and speaking up has focused on medicine and nursing (Kilpatrick et al., 2020; Peadon et al., 2020). Concurrently, students play an essential role in delivering care, with the roles and responsibilities differing between professions and from more senior colleagues (Fagan et al., 2016). Studies of PD have occurred with students from nursing (Fagan et al., 2016, Milligan et al., 2017) and

medicine (Pattni et al., 2019), however overall, the research is limited and consists primarily of self-reports (Milligan et al., 2017, Pattni et al., 2019). The paucity of research is even greater for students in the allied health professions (Milligan et al., 2017). The importance of the variable roles that students fill in delivering care and the different contexts in which students work make it essential to expand the study of compliance to groups outside of medicine and nursing.

Respiratory Therapy and Advanced Care Paramedic (ACP) practitioners and students interact with physicians and nurses in hospital and prehospital environments. These professionals bring unique education and experience to teams. Research incorporating other professions can help broaden the understanding of compliance. Some existing research in compliance scenarios has included RTs as members of interprofessional teams, yet other professionals, particularly those in primary care, are generally absent from the literature (Kilpatrick et al., 2020; Pattni et al., 2019).

Summary The extant research indicates knowledge about compliance in healthcare is in an emergent state with variable and inconsistent benefits of existing approaches to improve PD in team and IPCP settings (Kilpatrick et al., 2020; O'Donovan & McAuliffe, 2020; Okuyama et al., 2014; Omura et al., 2017; Peadon et al., 2020). Presently, in the literature, there is some evidence that hierarchical structures alone are not the most important variable in determining negative compliance or speaking up, and other variables may be more influential (Bould, et al., 2015; Friedman et al., 2015; Pattni et al., 2017; Sydor et al., 2013; Weiss et al. 2014). The variable efficacy of interventions intended to enhance PD and speaking up may be due to the powerful

social and cognitive factors that enact obedience, the lack of understanding about the influence of individual characteristics, and the nature of obedience.

Healthcare has unique and dynamic contexts with important macro and micro-level influences; however, the higher-order effects of human social interaction and cognition are generally consistent and, to an extent, universal (Ariely, 2008; Cialdini & Goldstein, 2004; Haidt, 2012; Hodges, 2017; Olsson-Collentine, Wicherts, & van Assen, 2020). When observing a set of individuals, variability in human social behaviour and cognition, social cognition may appear to be high; however when observing at the population level, humans behave and think consistently (Ariely, 2008; 2010; Gigerenzer & Goldstein, 1996; Kahneman, 2011; Sunstein, 2005). Essentially, as with any animal, human behaviour is universal. Often in the healthcare literature, as evidenced in this review, there is generally no indication of awareness of research external to healthcare that can inform the study and understanding of hierarchies and obedience. For example, Friedman et al. (2015) indicated they could find no guiding methods from psychology to develop a simulation script, though the research is abundant (Benjamin & Simpson, 2009; Perlstadt, 2013). For example, Kaba & Beran (2016) directly adopted the Asch paradigm to design simulations that examined conformity, and numerous variations and adaptations of the original Milgram studies have been conducted that could inform the design of simulation scripts related to obedience. For example, Bègue et al (2015) used a television game show setting; Bocchiaro, et al (2012) and Bocchiaro & Zimbardo (2017) used an academic setting, Burger (2009) and Grzyb & Doliniski (2017) used virtual settings; and Davis et al (2006) used an accounting firm. The field of psychology can be a valuable resource for understanding causative and internal mediating mechanisms of compliance and how aspects of collaboration,

teamwork, and IPECP can produce, not only positive patient outcomes, but also negative patient safety outcomes (Avorn, 2018; Kaba et al., 2016).

The use of simulation to train health professionals may provide an opportunity to deepen our understanding about the psychological mechanisms of obedience. It can help resolve the critique of the lack of real-world validity or verisimilitude leveled at psychological experiments (Bless & Burger, 2016). Ethical constraints for research with human subjects mean it is challenging to study obedience to authority using experimental designs and behavioral measures (Benjamin & Simpson, 2009; Elms, 1995). Simulation training in healthcare uses authority and hierarchy paradigms as a necessary aspect of training, and the full nature of the simulation may not be initially revealed to participants (Gaba, 2013). Using and developing simulations for training and testing of non-technical skills will also accrue more evidence for the validity of simulation for education.

By incorporating psychological theories and using simulation, it is possible to use an experimental design with conditions as close as possible to real-life without conducting an in-situ study. Experimental simulation is beneficial for IPCP research by providing definite dependent variables and good outcome measures that are often absent in IPCP research (Paradis & Whitehead, 2018; Schmutz & Manser, 2013). Interprofessional collaboration is important, but the focus on teams and IPCP often means the influence of individual differences is underemphasized. Individual differences, and the relative importance of differences, can be examined in simulated team environments. To develop a comprehensive understanding of obedience, it is also necessary to explore other crucial factors that can facilitate obedience, such as cognitive load, an underexplored factor for compliance in and of itself.

Statement of the Problem

When considering the prevalence of the problem of compliance there is a dearth of research, knowledge, and methods to deal with compliance in healthcare. Complex systems of mechanical and human components require multiple methods to address how suboptimal outcomes occur and allow for a better conception of how patient safety can be achieved (Cohen & Patel, 2020). Incorporating psychological theories³ can help address the complexity. To move towards a more complete conception of obedience and to ultimately reduce patient harm due to negative compliance, it is necessary to:

1. Improve knowledge about obedience to authority, and hierarchies, and promoting research grounded in the literature from psychology which generally has not been integrated into healthcare research.
2. Investigate factors, environmental and individual, that may facilitate or mitigate obedience to better understand how these factors function in healthcare contexts. Under *what* social, environmental, and individual conditions are people likely to be obedient or positively deviant?
3. Develop interventions or training that are effective and efficient and can fit within the existing health professional curriculum to promote positive deviance.

³ Throughout the dissertation, while addressing the need to integrate psychology, the theories utilized are referred to as being from social and cognitive psychology. This was done for simplicity in terminology, a strict taxonomical interpretation of social and cognitive psychology is not intended. Instead, the terms are used as broad classifications as theories of compliance have a basis in social and cognitive psychology. For example, Sherif's (1935) original studies on conformity using the autokinetic effect demonstrate the interrelated nature of the diverse fields of psychology. The terms are even more inclusive regarding theories such as Impression Management, Bounded Rationality, and Moral Foundations Theory, which originated in sociology, economics, and moral psychology, respectively. Yet all three theories are related to social and cognitive psychology. In a more general sense, all the theories drawn upon can fall under the classification of Behavioural Sciences. With increased interdisciplinary research occurring across the academy, categorical terminology is less relevant (Lau, 2017). The use of social and cognitive psychology is general and non-denominational, used to point to the origins of the theory of obedience and where the preponderance of research exists.

Research Questions

Guiding Question

To what extent, in what ways, and why, do health professional students demonstrate obedience to authority?

Primary Questions

1. What are the rates of negative compliance for health professional students and how are these related to Impression Management, Displacement of Responsibility, and Moral Distress?
2. Can simple educational material reduce the rate at which participants demonstrate Obedience to Authority; conversely will the educational material aid engagement in positive deviance?
3. Will high cognitive load increase the rate at which students demonstrate Obedience to Authority, conversely will high cognitive load inhibit positive deviance?

Secondary Questions

1. To what extent will Displacement of Responsibility facilitate Obedience to Authority?
2. Will Respect for Authority be a predictor of Obedience to Authority?
3. What is the influence of experience, confidence, age and sex on Obedience to Authority?
4. To what extent will students experience the need for Impression Management in a simulated compliance scenario?
5. Will the simulated compliance scenario elicit Moral Distress in students?

Dissertation Summary

This dissertation consists of one theoretical paper and three research studies.

Contextualized by obedience as a social heuristic, the studies are integrative and form a unit to

establish knowledge about the problem of obedience. In Chapter II, behavioural and psychological knowledge is used to design a provisional computational model of obedience to authority and variables that can facilitate obedience, including a social process of obedience. In Chapter III, the social environment where the obedience heuristic is applied is analyzed by determining the rate at which students across multiple professions experience negative compliance and some of the variables that can facilitate obedience. In Chapter IV, a study is described that tests the performance of the heuristic in a real-world environment by using a simulation scenario to conduct an experiment to examine a potential intervention for increasing PD, the effect of cognitive load, and several individual variables. In Chapters IV and V, to determine if and how people use the heuristic, several methods of analysis are summarized to understand students' behaviour, cognition, emotion, and perceptions. The findings from each study will be used to refine and add to the knowledge of obedience to authority in healthcare and direct future investigation and further refinement.

Table 1. Glossary of Terms

Construct	Definition	Reference
Compliance	“Compliance refers to a particular kind of response—acquiescence—to a particular kind of communication—a request. The request may be explicit... or it may be implicit.”	
Conformity	“Conformity refers to the act of changing one’s behavior to match the responses of others.”	(Cialdini & Goldstein, 2004)

Obedience	“... behaving in accordance with the opinions, advice, and directives of authority figures”	
Negative Compliance	Potential negative consequences that can arise from deference, yielding or complying with others. Compliance that produces harm, such as when a person does not speak up or alter a course of action believed to be inaccurate or unsafe	(Delaloye, 2017) (Green et al., 2017)
Positive Deviance	Action that counters behaviour that erodes professional values or creates negative outcomes. Speaking up or challenging authority Effectively taking action to prevent harm and negative consequences to a patient	(Blanton & Christie, 2003) (Pattni et al., 2019)
Impression Management	“The way people attempt to control the perceptions, or impressions that others have of them, the person’s self-presentation” “Ways in which people present an image of how they think their audience wishes to see them in face-to-face interaction”	(Goffman, 1956) (Solomon, Solomon, Joseph, & Norton, 2013)
Moral Distress	“The psychological disequilibrium and the state of negative feelings experienced when a person makes a moral decision but does not follow through by performing the moral behaviour indicated by that decision”	(Wilkinson, 1987)

	“Moral distress is a psychological response to morally challenging situations such as those of moral constraint or moral conflict, or both”	(Fourie, 2015)
Displacement of Responsibility	“...they [people] view their actions as stemming from the dictates of authorities rather than being personally responsible for them”	(Bandura, 1999)
Respect or Authority	An innate foundation of morality and an adaptive heuristic that “underlies virtues of leadership and followership, including deference to legitimate authority and respect for traditions”	(Haidt, 2012)
In Group Loyalty	Group-binding loyalty, duty, and self-control, the degree to which people favour their own group over others	(Haidt, 2012)
Heuristic	“A mental process that ignores part of the available information and does not optimize... it does not involve the computation of a maximum or minimum. Relying on heuristics in place of optimizing is called satisficing”	(Gigerenzer, 2010)
Satisficing	Finding a sufficient and satisfactory solution to a problem, looking for a good outcome opposed to a maximized outcome	(Simon, 1955)
Data Mining/Machine Learning	The process of discovering patterns within data and enhancing performance by improving predictive accuracy.	(Witten, et al, 2016)

CHAPTER II: OBEDIENCE TO AUTHORITY: AN INTRODUCTION FOR HEALTHCARE EDUCATORS, PROFESSIONALS, AND RESEARCHERS

Chapter Summary: This chapter describes obedience to authority as an inherent and complex human trait, and the need to approach obedience by developing a full understanding of how obedience exists in healthcare. The chapter briefly defines and provides an overview of the history of the study of obedience before integrating three different theories to argue that obedience is innate, and that this point of view will help us better understand why humans are obedient to authority.

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"We do not observe compliance to authority merely because it is a transient cultural or historical phenomenon, but because it flows from the logical necessities of social organization. If we are to have social life in any organized form—that is to say, if we are to have society—then we must have members of society amenable to organizational imperatives." (Milgram in Blass, 2002).

Introduction

Error in healthcare involves complex interactions of Latent factors: human factors and system factors; and Active factors: factors due to human operators, where distal and proximal causes can be multivariate and difficult to identify (Kohn et al., 1999). Proposed models to

handle Latent and Active error and improve patient safety include patient-centric care, actively tracking error, developing innovative tools for diagnostic support, and cross-disciplinary collaboration (Committee on Diagnostic Error in Health Care; Board of Health Care Services; Institute of Medicine; The National Academies of Sciences, Engineering and Medicine, 2015). Cross-disciplinary collaboration, or Interprofessional Collaborative Practice (IPCP), has been proposed to mitigate Active error and improve patient safety (Khalili et al., 2019). Unfortunately, the evidence for the effect of group communication and interaction on patient outcomes is variable with no incontrovertible benefits (Khalili et al., 2019; Paradis & Whitehead, 2018) and possible negative effects (Cosby, 2017; Kaba et al., 2016).

With the increased interdependence of health disciplines, emphasis on teamwork, and its unclear effects, it is important to examine how collaborative teams, interprofessional and uniprofessional, can produce negative patient outcomes. An important aspect of collaboration to examine is negative compliance through conformity and obedience to authority (Kaba et al., 2016). Negative compliance is when compliance through conformity or obedience to authority produces negative patient outcomes, in the healthcare literature these have been identified as issues of obedience and conformity (Cassell, 2005). While compliance, speaking up, and positive deviance are widely discussed and are an emergent area of research the integration, of the relevant psychological theory to understand causative mechanisms and the nature of compliance is lacking (Caverzagie et al., 2019; Peadon et al., 2020). Knowledge from areas outside healthcare is important as the understanding of errors in healthcare primarily falls along the lines of medical orthodoxy and is understood in medical terms and language (Croskerry et al., 2017, p xii). Knowledge from areas outside of medicine often face resistance, a Not-Invented-Here-Bias, however, it is practical, efficient, and logical to adopt existing knowledge rather than relearn

known issues, especially as outside knowledge can have important implications for teamwork, communication and collaboration, and health policy. If all healthcare providers are human, then they will be subject to the same cognitions and behaviours of all humans (Avorn, 2018; Myers et al., 2019).

Compliance, in general, and obedience to authority, specifically, are complex and multivariate. The purpose of the present paper is to describe obedience to authority, in its complexity, for an audience of healthcare professionals that may not have a background in psychology. This purpose will be achieved by 1) defining obedience to authority; 2) addressing two perspectives to understanding obedience that are commonly adopted in the healthcare literature; and 3) examining the social and cognitive bases of obedience including Bounded Rationality, Moral Foundations Theory, Social Influence, along with sundry social, environmental, and personal factors.

What is Obedience?

Compliance is a product of social influence, referring to internal or external changes in a person caused by real or imagined pressure from others (Barrett, 2017). In psychology, “compliance refers to a particular kind of response—acquiescence—to a particular kind of communication—a request,” the request can be an explicit and overt social force, or it can be an implicit social force that is subtle, indirect, and nonconscious (Cialdini & Goldstein, 2004). The two variables that encompass most compliance behaviour are the distinct constructs of conformity and obedience to authority (Barrett, 2017; Benjamin & Simpson, 2009). Simply, conformity is behaviour that is acquiescence to peers while obedience is acquiescent behaviour to an authority figure (Cialdini & Trost, 1998). Conformity and obedience are not antipodal but can exist together with conformity as an overlay of obedience to make obedience happen quicker

and easier (Cialdini & Trost, 1998). The study of conformity and obedience has a shared history that over the last 70 years, has created a body of research with a robust corpus of evidence in multitudinous and diverse applied fields (Barone et al., 2012). A brief overview of the genesis of obedience research can provide clarity.

Following the emergence of research on conformity and the seminal work of Sherif (1935) and Asch (1951, 1955), work by Stanley Milgram introduced Obedience to Authority as a paradigm of research in what are considered some of the most important studies ever conducted in psychology (Benjamin & Simpson, 2009). Milgram's work on obedience was inspired by the complicity and collaboration with the Nazi party by seemingly ordinary people in Germany and other countries, in enacting the Holocaust. Milgram sought to examine the parameters under which people would be obedient to an authority figure (Milgram, 1963). Milgram's experiments were the first in a long line of research establishing Obedience to Authority as a consistent aspect of human behaviour. Milgram originally conducted a series of 22 experiments, the specific details of which have been described elsewhere (Blass, 1999). Milgram's experiments examined various conditions for obedience, with the most famous being Experiment 2, or the baseline condition, where 65% of participants obeyed an authority figure to the terminus of the experiment, which meant the participant delivered a "shock," believed to be lethal, to a confederate (Milgram, 1974). The findings of the original studies have been consistently replicable, directly and conceptually, over fifty years later (Beauvois et al., 2012; Benjamin & Simpson, 2009; Blass, 1999, 2012; Bocchiaro et al., 2012; Bocchiaro & Zimbardo, 2017; Burger, 2009; Cheetham et al., 2009; Davis et al., 2006; Doliński et al., 2017; Grzyb et al., 2018; Perlstadt, 2013).

Criticism has been levelled at the Milgram studies, and concerns raised over the ethics, realism, and generalizability of the research and the proper interpretation of the results (Griggs & Whitehead, 2015; Miller, 2014). Much of the criticism ignores recent replication and focuses on the specifics of Milgram's research design, particularly the ethics of the study. What is most important is not minutiae but rather higher-order effects, theoretical implications, and the external validity established through subsequent research using direct and conceptual replication (Perlstadt, 2013; Salmon, 2020).

Two Perspectives

There are two primary perspectives to understanding obedience in healthcare in the literature. The first is influenced by the postmodernism and the humanities with no underlying theory, but unification through a specific vernacular language. The second approach is empirical and related to psychology. Compliance has been explored through other approaches, such as Crew Resource Management, and although integrative with the second approach is primarily derivative of other areas of research such as human factors with less focus on the distal causes and origins of compliance (Omura et al., 2017). The shortcomings and inadequacy of the first approach will be briefly discussed, the second approach will then be introduced and expanded on throughout the remainder of the paper.

Postmodernist-Humanities Approach

Many of the current perspectives on obedience focus on power dynamics conceptualized through post-modernist critical theories to address inherent power structures and systemic imbalances that produce oppression of those lower in the power structures (Angoff et al., 2016). The problem with post-modernist critical theories is the simplification of multivariate phenomena to a univariate issue of oppression and a focus on semantic, textual, and rhetorical

based assumptions devoid of data (Pinker, 2018). Such perspectives lack testable and falsifiable hypotheses providing only superficial insight. These perspectives lack empirical evidence and do not accrue evidence beyond suppositions based on cynicism and personal observation and experience (Gregg, 2000; Horgan, 1997; Pinker, 2018). A brief examination of three papers provides an example of the limitations associated with the postmodernist-critical theory approach.

In a 1987 paper, Campbell-Heider & Pollock (1987) discuss social and cultural factors impeding nurse-physician collegiality. The authors propose that impediments to collegiality result from ritualized and secretive systems in medicine that form structures of power based on sex stereotypes, knowledge protection, and economic oppression. For example, the authors posit the “medicalization” of obstetrics was done for purposes of social control of females by limiting the practice of midwifery by controlling scientific and medical knowledge. The hospital is identified as a “structural and functional arrangement which allowed men (physicians and administrators) to exercise this control over women.” The authors explain medical power structures as systems of economic oppression that protect physician’s salaries through maintaining patient referrals by excluding nurses from diagnoses.

In a 2003 paper, Coombs (2003) addresses challenges to physician-nurse teamwork. For Coombs, changes to economic factors, increased credentialization, evidence-based medicine, and the emergence of roles such as Nurse Practitioner make Campbell-Heider’s secretive systems and economic control arguments untenable. Yet, Coombs continues the systemic power and oppression argument. For Coombs, medicine seeks to exert power over nursing as a means of gender suppression, with medicine using its knowledge base as the source of power. According

to Coombs, medicine creates a power structure to exert control over nursing and preserve traditional gender roles.

Finally, in a 2016 paper, Angoff et al (2016) discuss an intervention, “Power Day”, meant to address the mistreatment of students, staff, and faculty by those in positions of power. Currently, and for some time, the preponderance of healthcare professionals are female, including the majority of matriculating and graduating medical students (Association of American Medical Colleges, 2019; Burton & Wong, 2004; General Medical Council, 2019; Le Feuvre, 2009; Phillips & Austin, 2009; The Association of Faculties of Medicine of Canada, 2019). Yet, the same language and perspectives, primarily invocations of systemic power and oppression, are still used. For Angoff et al., power and oppression are no longer gender or profession-specific, as Campbell-Heider or Coombs proposed, but is diffused across the healthcare system to any perceivable power-differential with the inevitable result of “structural violence”, “disempowerment” and obedience. Though the word “power” is broadly used, it is rarely defined. The ambiguous definition Angoff et al. provide for power is: “power as... employed and exercised through a net-like organization amongst the threads of which individuals operate”. Herein lies the problem, postmodernist-critical theory positions are based on language that is sufficiently plastic and ambiguous to be unilaterally applied by the user (Gregg, 2000).

This critique is not implying mistreatment does not occur, there is no need for improving collegiality, sex stereotypes do not exist, or people do not abuse positions of power. Rather postmodernist-critical theory perspectives of authority, hierarchies, and power cannot be used to understand the problem. The explanatory power ceases at superficial dichotomies of oppressed and oppressor and blanket explanations of power that are not systematically, or even coherently, described or defined. As demonstrated in the aforementioned papers, any situation can be

explained univariately, it is simply a matter of changing the agents of oppression without modifying, refining, or defining the explanation to align with reality.

These approaches have the illusion of explanatory depth, making it impossible to accurately assess the phenomena, leaving only questions (Pinker, 2018, p 46-47). What is power? Why do power structures or hierarchies exist? Why are some people in positions of power and others obedient? These questions are unanswered beyond semantics and vague tautological invocations of power itself. These perspectives, originating with writers such as Foucault, Derrida and Lacan, are anti-intellectual, anti-scientific, unobjective, non-empirical, atheoretical, ideologically laden, and should be abandoned (Hicks, 2004; Pinker, 2018). Understanding authority, hierarchy, and obedience require a shift to fields with actual empirical evidence, i.e., Social and Cognitive Psychology.

“Psychopathology, nonsecular beliefs, postmodernism, deconstructionism, and magical thinking are generally not considered in these discussions, although all clearly have the potential to exert powerful influences on rationality.” (Croskerry et al., 2017, p. 260).

Empirical Approach

Group dynamics provides the broader theoretical framework for understanding human's innate disposition to obedience and how human's social and cognitive aspects converge and interact (Tasca, 2020), one of the approaches that has been adopted to understand group dynamics within healthcare is the Hidden Curriculum. The Hidden Curriculum, in particular as discussed by Holmes et al., (2014), provides a more refined gateway to understanding compliance in healthcare, compared with post-modernist approaches, and with an approach to understanding issues of authority, hierarchy, and obedience, informed by social-cognitive Psychology (Holmes et al., 2014). The concept of a Hidden Curriculum does not originate in

healthcare (Hafferty & Castellani, 2019); yet it provides a well-developed context for compliance in healthcare systems and education with practical implications (Kumar et al., 2018). A Hidden Curriculum is an implicit but well-understood process of enculturation transmitting the ethos of what it means to be a group member. For a physician, it may include privilege, autonomy, and professional culture (Holmes et al., 2014). The Curriculum/Culture is not a conscious or meditated construct but produces social organization from individual's interactions and coalescence of values, practices, beliefs, and attitudes that function to create group cohesion transmitted and reinforced by group dynamics (Latane, 1996; Nowak et al., 2018). Professional cultures generally support behaviour that conforms to the norms of the profession, and people may enter certain professions or organizations because of an orientation towards an organizational structure that creates a good Person-Environment fit (Tesi et al., 2020).

Other research has also incorporated psychological theory, to varying extents, to study compliance. Research conducted by Beran et al. (2013; 2015), and Kaba & Beran (2016) adopted the paradigm established by Solomon Asch (1951) to examine how group pressure and social proof can produce conformity and inaccurate conclusions and decisions. Beran et al. (2013) used a knee arthrocentesis simulation to examine the behavioural influence of conformity in medical students. Two conditions were used, a knee model displaying prior inaccurate puncture sites and a "clean" knee model. In the inaccurate puncture condition, medical students made significantly more inaccurate insertions compared to those in the "clean" knee model condition. In another experimental design study with a synchronous group online learning event, medical students were placed in groups of four and asked basic knowledge questions (Beran et al., 2015) participants had significantly fewer correct responses in the experimental condition. Kaba and Beran (2016) investigated medical and nursing students reporting of vital signs taken from a

patient simulator. It was found nursing students reported inaccurate vital signs at a significantly higher rate than medical students. In the three studies the pressures of conformity had a negative behavioural influence on procedural accuracy, knowledge tests, and the reporting of vital signs. Kuo et al. (2020) examined the rate of reporting medication error after training using a problem-based scenario informed by Kolb's Experiential Learning Theory combined with a two-hour medication administration simulation. Participants in the problem-based learning condition reported errors at a higher rate than those in the control condition.

Some research has been conducted on the effect of individual differences on behaviour in compliance scenarios. Weiss et al. (2014) examined speaking up in physician-nurse dyads from the position of group dynamics and interindividual differences. The authors found those higher in the trait of self-perceived agency were more likely to speak up, and those higher in the trait of communion were less likely to do so. Barzallo Salazar et al. (2014) investigated cognitive and personality differences through the General Decision-Making scale and Self-Concept scale; however, no trait effects were found. Likewise, Sydor et al. (2013) examined personality differences measured through the Big Five personality traits, though found no relationship with participant behaviour. Self-efficacy has been found to positively predict physicians and nurses speaking up in simulated scenarios; additionally when peers made a mistake or instructions were unclear, females and older participants were more likely to speak up (Roussin et al., 2018). Daly Guris et al. (2019) found that repeated simulation and assertiveness training on speaking up increased student self-efficacy. Effects of cognitive load were also examined, though no effect was found.

The challenge in identifying and avoiding negative aspects of social organization, such as negative compliance, is that compliance generally functions in a positive manner aiding group

cohesion, performance and learning, and is necessary for navigating social environments (Campitelli & Gobet, 2010; Todd & Gigerenzer, 2012), including in healthcare (Vanstone & Grierson, 2019). Holmes et al. (Holmes et al., 2014) suggest that to counter the negative aspects of the Hidden Curriculum, rather than changing systems, it is more pragmatic and efficient to change individuals, aligning with the related proposal for improving IPCP by focusing on creating good individual collaborators (Bainbridge & Regehr, 2015). The individual change is focused on providing knowledge of the Hidden Curriculum through education and leveraging individual psychological tendencies in steps of priming, noticing, processing, and choosing to help students engage in “positive deviance.” Positive deviance is behaviour that counters actions that erode professional values or create adverse outcomes (Blanton & Christie, 2003), and is generally equivalent to “speaking up” or “challenging authority” (Omura et al., 2017). It is proposed knowledge created through teaching psychology, and behavioural sciences, cognition, rational analytical thinking, and creating awareness of the Hidden Curriculum will give students the ability to avoid negative outcomes (Croskerry et al., 2017; Holmes et al., 2014). The shortcoming of this rationalist method is that providing knowledge and relying on priming, noticing, processing, and choosing is unlikely to be powerful enough to change the individual to a pro-social actor with a need for self-consistency stronger than the need for group inclusion. The next section of this paper will draw from cognitive, moral, and social psychology areas to explain the origins and function of Obedience to Authority. Through improving the understanding of obedience, it will be possible to develop testable hypotheses and conduct research to help mitigate negative obedience and increase positive deviance.

The Basis of Obedience

Hierarchies as a form of social organization, and obedience to authority as the fulfilment of social roles, are aspects of social interaction for which humans have an innate disposition. In social species, hierarchies facilitate cooperation, reduce conflict, and improve the chances of survival and reproduction (Moosa & UD-Dean, 2011; Nisbet, 1966). Hierarchies enhance performance (Halvey et al., 2011) and are self-reinforcing to maintain order, status, and respect in groups (Magee & Galinsky, 2008). Evidence from anthropology and comparative psychology demonstrates that social hierarchies do not form by chance in human or non-human species and are the product of intrinsic attributes and social dynamics (Chase et al., 2002; Chou et al., 2021; de Waal & Suchak, 2010). Humans evolved to create hierarchies as a means of solving environmental and social challenges (Dubreuil, 2010) and concurrently evolved neural networks of cognitive and perceptual mechanisms to identify, interpret, and understand hierarchies (Koski et al., 2015). Humans demonstrate preferences for hierarchical organization and better comprehension of hierarchical structures (Zitek & Tiedens, 2012), an effect that is present in 15 month old infants, who when tested on understanding of group relations, are better able to process linearly structured social dominance hierarchies versus circular dominance structures (Mascaro & Csibra, 2014). Humans, across all societies, have a predisposition to form and maintain hierarchical and group-based systems of social organization, and the elements of hierarchies interact and reinforce each other to produce and maintain group-based social hierarchies (Sidanius & Pratto, 1999). The innateness of obedience results from the value for group and individual functioning, making altering negative obedience, obedience that produces harmful or undesirable outcomes, challenging. To understand obedience and change the way people interact to produce better team functioning and improve patient safety, understanding the

origins of obedience and the social, environmental, and personal factors that produce obedience is necessary. The basis of obedience can be understood through three interrelated theories: Bounded Rationality, Moral Foundations Theory, and Social Influence. Bounded Rationality functions as a strong overarching cognitive model of human psychology with the theories of Moral Foundations and Social Influence circumscribed within Bounded Rationality. The interrelation of the theories and the influence of social, environmental, and personal variables explain the underlying cognitive and social forces comprising the innate disposition towards obedience.

Bounded Rationality

The overarching theoretical construct for understanding compliance is Bounded Rationality and is potentially the best unifying theory under which most social and cognitive processes exist (Campitelli & Gobet, 2010). Bounded Rationality is the theory that humans do not optimize outcomes through incorporating the expected utility of all potential or relevant variables and outcomes, but rather search for and select the most satisfactory outcome (Simon, 1955, 1956). Bounded Rationality, first introduced by Herbert Simon (Simon, 1955), bridged the gap between psychological and economic theory (Barros, 2010; Simon, 1955, 1956), improving on the rational choice perspective that existed in economics, with broad influence in many fields (Kahneman, 2003; Kahneman, 2011; Rainey, 2001). Simon identified that learning theories of adaptive behaviour in psychology were much more powerful in predicting human behaviour than existing economic theories. Most essential for Simon was that humans do not function in a logically rational manner seeking to optimize outcomes in their environment, as had been assumed in economics. Instead, human Rationality is at best a crude striving for satisfactory outcomes rather than a set of utilitarian maximization rules. Maximization almost never occurs,

and often the unconscious is most influential in human decision-making; humans simplify the world from what it really is through information gathering based on what information and cognitive resources are available to make decisions (Campitelli & Gobet, 2010; Richardson, 2008). Instead of being optimizers or maximizers, humans often employ simplifications and heuristic strategies to make decisions, i.e., humans are satisficers. Satisficing is finding a sufficient and satisfactory solution to a problem. For example, in healthcare the well-known cognitive bias of premature closure during the diagnostic, clinical reasoning, process would be an example of satisficing (Rylander & Guerrasio, 2016). When a solution is found that surpasses a threshold level of adequacy, no further search or evaluation occurs; this is a substitute for the stopping rule in maximizing utility. The threshold level of adequacy for determining a satisfactory solution can be adjusted up or down based on variable environmental, physical, and psychological factors. The adaptive advantage of satisficing is in avoiding systematic and exhaustive searching for alternative solutions or outcomes. Possible decisions are examined sequentially, and not all will be evaluated if a satisfactory decision is arrived at (Richardson, 2008). By shifting to looking for a good outcome, a satisficing outcome as opposed to a maximized outcome, an organism saves “computational” demands on the limited “computing” speed and power the organism has (Simon, 1955).

The theory of Bounded Rationality incorporates the systems, processes, and environment in which an organism functions. The systems that organisms must adapt to are dynamic, complex, and different humans have different boundaries for Rationality due to cognitive and personality differences. In addition, the environment can impose restrictions on these boundaries. The environment is the “life space” that has relevance to the organism. For healthcare, the “life space” can be any setting where a person is engaged in their profession. The environment may

also include physical and non-physical stimuli that interact with an organism's perceptual powers and storage capacity, which are limited. By understanding the complexities of the systems that impose contingencies on decision making the utility of using satisficing strategies, such as simplifications, heuristics, and instinctual behaviour over maximizing and optimizing becomes apparent. Obedience to Authority exists as a satisficing strategy.

Simon's theory was influential on Kahneman and Tversky's work providing a direct theoretical lineage to the development of biased Rationality and Dual Processing theory (DPT). Dual Processing theory describes two types of cognitive processing that humans engage in, rapid and intuitive, non-analytical System 1 thinking and slow, analytical, and effortful System 2 thinking. Neither of these Systems are actual neurologically located cognitive structures, but rather descriptors for the different ways that humans process information (Kahneman, 2003, 2011). Kahneman and Tversky's work can be thought of as an extended model of Bounded Rationality helping to demonstrate the validity of Simon's theory (Campitelli & Gobet, 2010). The biases and heuristics humans use as cognitive strategies in fast and frugal non-analytic (System 1) thinking, and the subsequent errors that can result, are products of satisficing (Kahneman, 2003).

Bounded Rationality also ties strongly to evolutionary psychology. Evolutionary psychology identifies that humans move through the world constantly, having to solve adaptive problems and will do so in the easiest way possible. The problems faced may be physical, social, emotional, or cognitive, leading to the fundamental question of Evolutionary Psychology: "What is the psychological machinery and behavioural outputs to solve this adaptive problem?" (Lewis et al., 2017). Biases and heuristics are intuitive satisficing strategies for solving adaptive problems that are evolved and innate, meaning organized ahead of experience (Marcus, 2004),

(Gigerenzer, 1991; Marcus, 2004; Richardson, 2008). When compliance behaviours are understood in the context of Bounded Rationality and Evolutionary Psychology as heuristic satisficing solutions or procedures for many of the physical, social, emotional and cognitive problems faced by humans in complex environments, it is apparent obedience is not simply a product of arbitrary, constructed power structures.

Moral Foundations Theory

As explicated through Bounded Rationality, most human cognition does not involve ratiocination, and if it is treated as such, inaccurate understandings of cognition and behaviour will occur. Classical notions of morality are related to classical theories of Rationality, much like classical economics, where humans are analytical beings, weighing the evidence in a situation, like a judge, to come to a decision (Haidt, 2001). Under such theories, compliance behaviours are viewed as actions under the rational control of reasoned conscious processing, and inappropriate reactions are simply a moral failing.

The predominance of the rationalist perspective in moral psychology was partly due to the influence of Kohlberg's theory of moral development (Carpendale, 2000; Mikhail, 2021), with a basis in classical rational thinking (Haidt, 2012). Kohlberg's stage theory of moral development was inspired by Piaget's stage theory of child development (Carpendale, 2000; Mikhail, 2021). Humans move through a universal set of stages of moral development towards a final optimal level of moral reasoning; post-conventional moral reasoning. Kohlberg's theory and in particular the final stage of post-conventional moral reasoning has a Kantian orientation towards a categorical imperative (May, 2010). In Kohlberg's theory, obedience is at stage one of pre-conventional reasoning. Much of Kohlberg's theory has been criticized (Carpendale, 2000;

May, 2010; Mikhail, 2021), with Moral Foundations Theory emerging as an amendment to Kohlberg's theory (Graham et al., 2018; Haidt, 2001).

Moral Foundations Theory posits humans do not reason in the classical sense or move through stages of moral development, but rather are social intuitionists, and moral reasoning is post-hoc and does not produce moral judgment; rather intuitive moral judgment comes first. Moral intuitions cause humans to make moral judgments that are cognition but are not reasoning. Moral reasoning follows judgment. Rather than being private, moral judgment is an interpersonal ex-post-facto social action of interpretation or explanation to convince others of the acceptability of the moral intuitions that produced actions or thoughts. Moral intuitions appear as judgments of approval or disapproval, but the process that produced the approval/disapproval is cognitively unavailable. Moral judgments are influenced by a matrix of five foundational moral intuitions that all humans possess at varying levels. The moral matrix is comprised of two individualizing foundations, Harm/Care, Fairness/Proportionality, that relate to evaluative judgments for individuals, and three binding foundations for group maintenance and protection, Purity-Sanctity, Ingroup Loyalty, and Respect for Authority (Haidt, 2012). Human's moral intuitions are quick, effortless, and automatic thoughts and can be described as satisficing strategies or heuristics situated within Bounded Rationality (Gigerenzer, 2010; Sunstein, 2005). Recent evidence has indicated that moral intuitions are influenced by genetic heritability (Smith & Hatemi, 2021).

Respect for Authority is an adaptive heuristic for complex and dynamic social systems that can have a strong influence in eliciting obedience to authority. Respect for Authority is an innate foundation of morality because it functions well as a heuristic, or satisficing strategy, for dealing with the problems that govern social functioning (Graham et al., 2018; Graham et al.,

2011; Haidt, 2001). As human's moral matrices differ due to genetic and cultural influences, in particular along the individualizing and binding foundations, the influence of Respect for Authority can be expected to be variable for individuals. The innateness of respect, along with the other four moral foundations, and subsequent obedience as a moral disposition, opposes classical maximizing perspectives, along with the post-modernist views, that fix morality at rationality and socialization.

Cognitive neuroscience provides further evidence for the intuitionist view of morality. When people are presented with images of moral violations and dilemmas and are assessed using fMRI, the areas of the brain associated with emotional processing, the medial frontal gyrus, posterior cingulate gyrus, and angular gyrus-bilateral are activated to a greater extent than with non-moral problems or impersonal moral dilemmas. The unique patterns of neural activation indicate systematic variations in moral judgments that correlate with emotions (Greene et al., 2001; Greene, 2015). Cheetham et al (2009) used a virtual Milgram paradigm to observe whether the distress experienced with providing a shock was associated with personal distress related to the social moral dilemma of administering shocks or was oriented towards the other through empathic concern. Neural activation was associated with affective processing of pain through the amygdala but not in regions associated with affect sharing, specifically the anterior cingulate cortex and insula. Activation in the regions associated with self-oriented affective emotions of pain support the notion that obedience elicits emotional responses oriented towards the personal discomfort of the social moral dilemma presented rather than empathic concern for the other; personal moral intuitions are predominant. The physiological evidence supports the theory that people's initial judgments and behaviour are reactive emotional responses and not rationalist ones. Rather than viewing obedience as solely a rational moral failing it is important to

understand that the driver of the behaviour is an innate automatic cognitive process, a functional heuristic. Instead of examining post-hoc reasoning as causal, it is necessary to look to the deeper origins of behaviour and cognition. If emotional affect takes primacy in generating judgment and behaviour, it is unreasonable to expect people to function as rationalists and subsequently to view compliance as a rational moral failing. The driver of the behaviour is often a functional heuristic activated by a foundation of the moral matrix.

The moral intuitionist perspective has strong evidentiary support (Mikhail, 2021) and is essential for understanding compliance that can produce medical errors. The importance is not simply because of the moral and ethical implications of patient harm (Stark & Fins, 2014), but because the moral intuitionist perspective provides a basis for understanding the human disposition towards obedience is shaped by cognition unbeknownst to the human actor. Humans are satisficers, intuitionists, and reactionary and although humans can think rationally, it is inaccurate to assume or expect people will think rationally about being obedient to authority.

Social Influence

Obedience to Authority is a heuristic, or satisficing strategy, that not only arises in Moral Foundations Theory, but is also in a parallel theory, Social Influence. Social Influence details the pervasive influence people have on each other, whether in brief, transient interactions or long-term relationships (Cialdini, 2006, Cialdini, 2010; Genschow et al., 2020; Loh & Ren, 2020). For example, one of the classic studies in the field is the door-in-the-face (DITF) technique by Cialdini et al (1975). The DITF technique is the method of eliciting compliance by making a small request after a larger one. A small request that follows an extreme request is more likely to be accepted than if the the small request was made on it's own. The underlying process for the effect arises from reciprocal concessions as an aspect of the reciprocity norm. Going from the

extreme request to the small request is seen to be a concession from the requester. After rejecting the extreme request, individuals may feel the need to reciprocate the concession by accepting the smaller request. The original study has recently been directly replicated, with results that are consistent with the original findings (Genschow et al., 2020). Attempting to understand how we can influence others and others may influence us is a capacity that is present in infancy (Baillargeon et al., 2016). The capacity and skills for understanding what is socially valued are further refined through childhood and continues into adolescence and adulthood (Heyman et al., 2021). Social Influence is explanatory of the individual and social functioning of authority and the strength of authority to elicit obedience. Within theories of Social Influence, several mechanisms can lead to compliance behaviour (Cialdini & Goldstein, 2004; Cialdini & Trost, 1998). The six primary mechanisms are Consistency, Liking, Scarcity, Social Proof, Reciprocity, and Authority. Each of these mechanisms can cause compliance to occur as a Fixed Action Pattern (FAP). FAP's are commensurate with heuristics, like moral intuitions, such that they are a process of affective primacy where a person's conscious cognitions are secondary to intuitive cognitions. A FAP occurs when a heuristic is enacted through a set of social and individual conditions that influences a person's behaviour. The impetus to engage a behaviour may be opposed by post-hoc cognition, such as "it is not right to do this", but social and innate conditions can be so strong that the person will be unable to resist engaging in compliance. The mechanisms eliciting FAP's are powerful because the mechanisms support the achievement of three essential human goals: 1) the goal for accuracy and effective action through an accurate perception of reality and reacting accordingly; 2) the goal of inclusion through developing and preserving meaningful social relationships; and 3) the goal of maintaining a favorable self-concept (Cialdini & Goldstein, 2004).

The Goal of Effective Action indicates people are motivated to appear competent and reliable. When a person is seeking to fulfill perceptions of competence and reliability they will attempt to behave appropriately, accurately, and will look to social norms to do so. People tend to look to descriptive norms that inform us how to act and provide a model for behaviour. The model for descriptive norms can be a group or single person who is successful or knowledgeable or perceived to be successful based on position in a hierarchical structure, i.e an authority figure. To appear to be behaving accurately or normatively, people may copy the behaviour modeled by others or follow others lead. Modelling is an effective method for saving time and cognitive power to appear competent and reliable, especially in situations that are novel, ambiguous, or uncertain; support for modelling exists from Social Learning Theory (Pratt et al., 2010). When an authority directs a request towards a person, the desire to appear competent and reliable can produce obedience, even when the request's outcome is inaccurate.

The Goal of Building and Maintaining Social Relationships also elicits behaviour that results in Obedience to Authority. When seeking social inclusion, people will observe injunctive norms, i.e. socially acceptable behaviours. Injunctive norms are understood through how a group prescribes appropriate behaviour and proscribes inappropriate behaviour. Injunctive norms do not need to be explicitly taught and rarely are, but injunctive norms are often supported through social proof (Cialdini & Goldstein, 2004). For example, people may not be intrinsically motivated towards social responsibility, but are instead motivated by understanding and doing what the group perceives as correct. Suppose the group indicates that hand washing prior to and after entering a patient's room is correct. In that case, someone seeking inclusion in the group will feel compelled to follow the norm of social responsibility and wash their hands (Cialdini, 2006). Social Proof is not exclusively group oriented but can occur through the behaviour of an

influential individual, such as an authority figure. To build and maintain social relationships through following injunctive norms, one can look to an authority for how to behave and subsequently be influenced by the authority. It is necessary to find the means to develop self-reinforcing behaviour to overcome injunctive norms and a lack of social support.

To fulfill the Goal of Self Concept Management, people engage in behaviours to maintain a consistent self-image or self-expectations. Self-images or self-expectations are generally positive ones, though this is not always true (Arens & Stangier, 2020). Self-images and self-expectations form personal norms and self-concept through internalized values. The self-concept tends to be self-reinforcing and can produce distress when not met (Cialdini et al., 1991; Lamiani et al., 2017). People with strong personal norms will engage in behaviour that aligns with that norm when self-awareness of the norm is enhanced; however, social norms are important and compete with personal norms. For example, people differ in the strength of the moral foundation Respect for Authority. A person who ranks highly in Respect for Authority will be more likely to be obedient to authority to be consistent with that personal norm. However, there may be a competing social norm that devalues Respect for Authority (Graham et al., 2011). To behave consistently with the personal norm and fulfill the need for self-concept maintenance, it can be hypothesized the person will act according to the personal norm and be obedient. This is the mechanism invoked by Holmes et al (2014) to increase positive deviance; however, the goal of self-concept management can relate to many aspects of maintaining a personal self-image and function in a manner counter to that expected by Holmes et al (2014). For example, a self-perception of being trustworthy may result in obedience if a person believes being obedient to an authority indicates to the authority, and possibly others, that you are trustworthy (Cialdini, 2006). To modify the self-concept and create personal norms strong enough to counter the proscriptive

norms of a group, providing information alone would likely be inadequate. Other means of self-concept change are necessary.

Obedience to Authority solves social and personal adaptive problems and the Goals of Effective Action and Accurate Behaviour, Building and Maintaining Social Relationships, and Self-concept Maintenance. The functionality of the mechanism of obedience to authority in fulfilling these goals helps explain, in part, why Respect for Authority is an effective satisficing strategy and developed as a moral foundation and why it has a strong influence on human behaviour. Cumulatively Bounded Rationality, Moral Foundations Theory, and Social Influence demonstrate a high level of consilience that supports Obedience to Authority as an innate human trait (Wilson, 1998). Rationalist theories downplay the influence of instinct and emotion on behaviour (Lepage et al., 2018); however, explanations of obedience that do not account for the instinctiveness and emotionality of compliance are marooned at a level of superficial description.

Social, Environmental, and Personal Factors

In addition to the innate cognitive substructure underlying the disposition to obedience, other variables that can influence compliance have been examined in applied fields, including aviation (O'Connor et al., 2012), business (Davis et al., 2006), politics (Frimer et al., 2014), and military studies (Richardot, 2014). Up to 40 variables have been identified that may produce negative compliance in a healthcare setting (Delaloye, 2017). Variables that enable the obedience heuristic can be thought of as a network that can interact and influence other variables or function independently (Delaloye, 2017). While all factors are important, it is most valuable to understand a few key variables that best explain the process of obedience rather than all potential conditions (Milgram, 1963).

Variables that could influence obedience can include interrelated Environmental, Individual, and Social influences, generally reflective of Social Cognitive Theory's (SCT) Person, Behaviour, and Environment influences (Lo Schiavo et al., 2019). Social Cognitive Theory can provide a framework for understanding how Person, Behaviour, and Environmental factors interact with the disposition toward obedience to produce behaviour. Due to the depth and breadth of SCT this is beyond the purview of the present paper. See Table 1 for a list of relevant Environmental, Individual, and Social influences characteristics to investigate for Obedience to Authority in healthcare.

Table 1. List of relevant variables for obedience to authority

Cognitive Load (Burgess, 2010; Caverzagie et al., 2019)
Hierarchical Position (Delaloye et al., 2017)
Diffusion and Displacement of Responsibility (Bandura, 1999; Bould et al., 2015)
Personality (Bègue et al., 2015; Tesi et al., 2020)
Ethnic/Cultural background (Blass, 2012)
Moral Distress (Lamiani et al., 2017)
Impression Management (Solomon et al., 2013)
Experience and Procedural knowledge (Milgram, 1974)
Task Interdependence (Khademi et al., 2020)

The interaction of the variables that can influence obedience represents the principle of equifinality. In psychology, equifinality is the concept of the same final state being achieved through various influencing factors (Sato et al., 2009). In complex and dynamic healthcare

systems, a person will likely experience many of the factors of obedience, with all, some, or a single variable playing a role in influencing if a person will demonstrate obedience or not.

Identifying the relative importance of each variable and how the variables interact in healthcare contexts will allow for the identification of scenarios where obedience may be likely as well as the development of strategies and education for dealing with these scenarios and improving patient safety.

Conclusion

Humans carry an innate disposition for obedience to authority; however, obedience is necessarily a social event that does not occur in isolation, requiring another person's influence. For the sake of parsimony, the influence can be considered as the direct interaction of two people and can have positive or negative outcomes; this is the primary challenge of obedience. As discussed, obedience is adaptive and necessary for human social interaction and is often instructive and educative, yet certain scenarios can produce negative outcomes. The challenge is not to eliminate obedience to authority through changes to systems and social structures but rather to make cognitive amendments to individuals to mitigate negative outcomes. As indicated by Holmes et al (2014), Bainbridge & Regehr (2015), and Croskerry et al (2017), it is practicable and likely the most efficacious approach to place the locus of change on individuals. However, the approach of producing rational-analytical thinkers educated on human bias while appropriate is not sufficient (Norman et al., 2017). Change to the individual's self-concept achieved through the application of some of the same principles discussed under Social Influence that produce FAPs, primarily the consistency principle, may enhance the ability to engage in positive deviance. The main advantage of influencing individuals through an educational intervention does not require the attempt to reorder human social structures or avoid situations of obedience

but rather promote people to speak up when they believe that the authority is incorrect or inaccurate. Obedience is a construct that is too powerful, complex, multifactorial, and ecologically adaptive to eliminate. Neither is it possible to eliminate negative outcomes due to obedience; what is possible is *better* outcomes.

While obedience to authority is an innate disposition, ratiocination is not the default cognitive mode, and a multitude of variables, internal and external, can influence obedience; a deterministic argument is not being made. The cumulative influence of the factors that produce obedience can be powerful, yet obedience does not occur to a non-agentic actor. Humans have personal agency and the ability to influence their own cognitions and behaviour (Bandura, 2001). While obedience to authority can be legally exculpatory, it is not morally exonerating, and it does not mean that individuals do not have responsibility and cannot act and be educated to act. It is possible for people to engage in positive deviance. By understanding the powerful innate aspect of obedience to authority the possibility can be enhanced. Obedience is a universal human trait that is the outcome of numerous factors that create a disposition to obedience for agentic actors (Bandura, 1999, 2001; Haidt, 2012) but is not blind submission to authority (Milgram, 1974; Richardot, 2014). It is intended that by creating an understanding of obedience, researchers, practitioners, educators, learners, and administrators will be able to better understand obedience. A better identification of the multivariate distal and proximal Active human factors related to obedience will assist in identifying, testing, and implementing methods to improve positive deviance and mitigate negative outcomes.

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CHAPTER III: A MULTI METHOD EXPLORATORY STUDY OF HEALTH PROFESSIONAL STUDENTS EXPERIENCE WITH COMPLIANCE BEHAVIOURS

Chapter Summary: This study used a survey design to measure the frequency with which health professional students experience compliance, defined by obedience to authority and conformity, and integrate these experiences with Impression Management, Displacement of Responsibility, and Moral Distress. The results indicate compliance is often encountered and Impression Management, Displacement of Responsibility, and Moral Distress are prevalent.

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Background

Medical errors and patient harm continue to be a problem at all levels of healthcare delivery (Canadian Institute for Health Information, 2019; Makary & Daniel, 2016; Vogel, 2016) and while the antecedents of harm are complex and span all facets of health systems, the causes can generally be categorized as Latent and Active (Kohn et al., 1999). Active causes of error include those attributable to human actions (Kohn et al., 1999). Human causes that contribute to harm are widely explored yet there are human factors in need of further elucidation, including group dynamics (Kaba et al., 2016). A group is three or more people gathered for a common reason whose activity results in some kind of output; the processes, outcomes, and perceptions or experiences of the group are the dynamics (Tasca, 2020), see Table 1 for further definitions.

Table 1 Common Constructs and Definitions

Construct	Definition	Reference
Compliance	“Compliance refers to a particular kind of response—acquiescence—to a particular kind of communication—a request. The request may be explicit... or it may be implicit.”	(Cialdini & Goldstein, 2004)
Conformity	“Conformity refers to the act of changing one’s behavior to match the responses of others.”	
Obedience	“... behaving in accordance with the opinions, advice, and directives of authority figures”	
Negative Compliance	Potential negative consequences that can arise from deference, yielding or complying with others Compliance that produces harm, such as when a person does not speak up or alter a course of action believed to be inaccurate or unsafe	(Delaloye, 2017) (Green et al., 2017)
Impression Management	“The way people attempt to control the perceptions, or impressions that others have of them, the person’s self-presentation”	(Goffman, 1956) (Solomon, Solomon, Joseph, & Norton, 2013)

	“Ways in which people present an image of how they think their audience wishes to see them in face-to-face interaction.”	
Moral Distress	“The psychological disequilibrium and the state of negative feelings experienced when a person makes a moral decision but does not follow through by performing the moral behaviour indicated by that decision”	(Wilkinson, 1987)
Displacement of Responsibility	“ ...they [people] view their actions as stemming from the dictates of authorities rather than being personally responsible for them”	(Bandura, 1999)

Within the complexity of group dynamics and possibilities for patient harm, compliance behaviour needs further research (Kaba et al., 2016). Compliance behaviours can be classed primarily as conformity and obedience. Conformity is behaviour aligning with peers, while obedience is acquiescence to a request made by an authority (Cialdini & Goldstein, 2004). When compliance produces harm, such as when a person does not speak up or alter a course of action believed to be inaccurate or unsafe, it is considered negative compliance (Green et al., 2017). The challenge for understanding compliance in the context of healthcare is identifying or predicting when harm may occur as conformity and obedience tend to be socially and ecologically adaptive and positive (Marsh et al., 2004; Todd & Gigerenzer, 2012). Much of our learning is social (Bandura, 1971) and compliance behaviours are important for learning and understanding norms for appropriate social interactions, learning skills and engaging in accurate

behaviour, and self-concept and identity development (Cialdini & Trost, 1998). As adaptive behaviours conformity and obedience are so functional that it becomes extremely difficult to override them and speak out against an authority or group, to engage in positive deviance, when one thinks what is occurring is wrong (Cialdini, 2006; Holmes et al., 2014).

A large degree of the literature published on negative compliance in healthcare has been focused on compliance in medicine and nursing trainees (Kilpatrick et al., 2020). Students occupy a low position in healthcare hierarchies and as a result are susceptible to negative compliance through conformity and obedience (Coombs, 2003; Delaloye, 2017; Delaloye et al., 2017; Sexton et al., 2015). As negative compliance is becoming more frequently discussed in the literature it is generally assumed negative compliance and the prevailing issues are well documented and understood. However, much of the existing literature covers anecdotal experiences with situations that caused compliance and theoretical suppositions about causes and student experience while lacking causative explanation (Fisher & Kiernan, 2019; Liao et al., 2014; Peadon et al., 2020; Sur et al., 2016; Voogt et al., 2019; Wray et al., 2016). There is a small but emerging body of experimental work on these constructs based in psychological theory (Beran, 2015; Beran et al., 2013; Daly Guris et al., 2019; Kaba & Beran, 2016; Kuo et al., 2020). Recent studies have established the high frequency with which medical students and residents, nurses, and staff physicians witness issues with professionalism and patient safety, and experience challenges to speaking up (Mak-van der Vossen et al., 2018; Martinez et al., 2017; Schwappach et al., 2019; Schwappach & Sendlhofer, 2020) yet currently lacking are frequencies of how often health professional students from a range of professions experience negative compliance integrated with psychological theory and relevant constructs (Peadon et al., 2020).

It is not possible to determine these experiences retrospectively through reviews of cases or patient records (Norman et al., 2017). Patient records only indicate harm and not the antecedent conditions that led to the outcome. Through observation, it may be possible to see a case where a person should have spoken up but did not. Yet this does not provide information as to why a person did not speak up. Did a person know that something was wrong? Did a person not speak up out of a concern for causing a disturbance? Did the person believe what others were doing was probably correct despite personal uncertainty? The most direct method to understand these questions is to obtain student reports. Without foundational empirical knowledge about the rate of an experience or event integrated with an attempt to understand the social and cognitive aspects of the event, it is not possible to fully understand the phenomenon.

There are numerous variables influencing compliance (Bègue et al., 2015; Blass, 1999; Cialdini & Goldstein, 2004; Delaloye, 2017; Lepage et al., 2018; Milgram, 1965). To understand group dynamics and compliance, it is useful to look at areas outside of the traditional silos of medical knowledge such as psychology (Croskerry et al., 2017; Kaba et al., 2016), which has an extensive history of studying compliance (Reis, 2010). Three variables that relate to the frequency with which people may engage in compliance that can result in harm are Impression Management, Displacement of Responsibility, and Moral Distress

Impression Management is the way people attempt to control the perceptions, or impressions that others have of them, the person's self-presentation (Goffman, 1956). Impression Management consists of two components, impression motivation and impression construction. Impression motivation is comprised of the goal-relevance, desired outcomes, and discrepancy between the current and desired image. Impression construction consists of the image created in relation to self-concept, desired and undesired identity images, role constraints, target values, and

current social image (Leary & Kowalski, 1990). Expectations of people based on place in a hierarchy can create the conditions for compliance as a person attempts to fulfill the expected role in the context of individual self-presentation, as well as group presentation. Impression Management has been shown to influence compliance behaviours with people being more likely to acquiesce to requests that will present themselves in a positive light to a desired other (Rind & Benjamin, 1994). For example, in an interprofessional health context, nurses in a hospital would engage in Impression Management to maintain the perception of collaborative work although collaboration was often not possible because of constraints imposed by the practice setting (Lewin & Reeves, 2011). Expectations regarding different roles have been shown to cause people to behave in accordance with those roles in a professional setting (Guadagno & Cialdini, 2007).

Displacement of Responsibility is identified as one of the most important and strongest influences on submission to authority (Bandura, 1999; Bould et al., 2015; Davis et al., 2006; Milgram, 1963). When a person can, or is given the opportunity to, displace responsibility for actions or outcomes, the person is spared engaging with the outcome and possible rapprochement (Bandura, 1999). One of the primary ways people deal with the displacement of moral control or responsibility is through plausible deniability. The cognitive enactment of plausible deniability is the method through which people engage in motivated reasoning and uncritical acceptance that allows the person to deny they behaved immorally (Bersoff, 1999) and make themselves believe they did not act immorally (Ariely, 2008). People engage in motivated reasoning for plausible deniability in two ways (Epley & Gilovich, 2016). First, when considering propositions that people would prefer to be true, they ask “Can I believe this?” Can I believe this has a low evidentiary standard, for example, “I did not act immorally because someone else told me to do

it". Second, when considering something a person does not want to be true, they will ask "Must I believe this?" Must I believe this has a higher evidentiary standard as some confirmatory evidence is often available, for example, "someone became ill because I did what I was told", and requires a more rigorous search for a reason not to believe it, "if I didn't do what I was told I would have failed placement and someone else would have done it anyway". The influence of Displacement of Responsibility has been demonstrated in healthcare (Bould et al., 2015) and numerous other areas (Bandura, 1999; Davis et al., 2006; Meeus & Raaijmakers, 1986; Richardot, 2014).

Negative personal outcomes can occur because of compliance, whether compliance occurred through Impression Management, Displacement of Responsibility, or other means. A highly impactful negative outcome is Moral Distress. Jameton (1984) defined Moral Distress as: "negative feelings that arise when one knows the morally correct response to a situation but cannot act accordingly because of institutional or hierarchical constraints." Wilkinson (1987) further accounts for the psychological factors of distress: "the psychological disequilibrium and the state of negative feelings experienced when a person makes a moral decision but does not follow through by performing the moral behaviour indicated by that decision". Moral Distress can arise in healthcare due to conflict that occurs between the maintenance of a person's moral integrity, the internal consistency of a set of personal standards, and behaviour constrained by external factors (de Raeve, 1998); or more simply the experiencing of a moral event and the resultant psychological distress (Morley et al., 2019). Institutional, environmental or system factors can create Moral Distress through challenges imposed to the maintenance of moral integrity creating a sense of futility and can lead to negative psychological and physical outcomes including burnout, fatigue, disengagement and increased susceptibility to negative

compliance (Atabay et al., 2015; McAndrew et al., 2018; Monrouxe et al., 2017; Schwenzer & Wang, 2006; Wiggleton et al., 2010).

The principles of compliance are nearly universal (Avorn, 2018; Graham et al., 2011; Greene, 2015; Haidt, 2007, 2012) and function similarly in healthcare as in other contexts. Obtaining insight into how students experience and think about compliance and in what ways these are related to, or reflect, frequency of behaviour can aid in developing a better understanding of where more detailed research is needed and what means might be taken to address negative compliance. It is necessary to know the extent of the problem and why it occurs. Is negative compliance something only rarely experienced but because of its impact it is highly salient and frequently discussed or is it something experienced daily and the risk of harm is even higher than anticipated? Does Impression Management factor into compliance or is it strictly a matter of Displacement of Responsibility? These things are unknown.

The present study will take an exploratory approach to understand the frequency with which students experience negative compliance related to obedience and conformity, and three related psychological phenomena. Two research questions have been developed utilizing a multi-method approach to examine experiences and cognitions around compliance behaviour.

Research Questions:

1. *Experiences and Expected Behaviour:* How frequently do students experience negative compliance through conformity and obedience and what are some of the possible underlying social and psychological influences and outcomes?
2. *Perceptions of Compliance:* What are students' perceptions of obedience and conformity? Can common themes be derived from these?

Methods

Survey Development

A self-report survey with 39 questions was designed to explore the frequencies (by week, month, and 6 month intervals) of participants' experiences with Conformity and Obedience including Impression Management, Diffusion of Responsibility, and Moral Distress. Included as a part of the survey was a separate measure to examine the Better than Average Effect (BTAE). Results of the BTAE portion of the survey indicate that health professional students expect to behave better than peers when it comes to speaking up in a compliance scenario. Survey items were tested using cognitive interviews (Peterson et al., 2017) conducted with practitioners and students from the fields of health sciences, psychology, educational psychology, and business. Items were modified based on feedback provided during the cognitive interviews (**for a copy of the full survey please see Appendix A**)

Analysis

All statistical analyses were carried out using SPSS Version 25 (IBM Corp, 2017). Frequencies and descriptive statistics were used for the analysis of rates of behaviour. Thematic analysis was used to examine responses to the open-ended item. A semantic inductive approach was taken. The text was independently examined by the researchers (EV and SK) and themes were generated. The authors then compared and reviewed the independently identified themes to detect commonalities and discrepancies. A final set of themes was developed based on discussion between the authors (Braun & Clark, 2006).

Participants

Participants were recruited from ten health sciences programs from four institutions with credentials ranging from certificate programs to graduate degrees. Participants were recruited to the study through emails sent via departmental listservs at the University of Alberta and during an interprofessional simulation event hosted at the University of Alberta during the 2019 Winter Semester. The survey was completed online through the web-based survey platform Qualtrics. Participants reviewed and completed a consent form, providing written consent, prior to completion of the survey. Ethics approval was granted by Research Ethics Board 2 at the University of Alberta, Pro00081948.

A total of 102 participants began the survey with 69 completing the entire survey. Data were examined for outliers; two influential cases were identified and determined to be careless responding and so were removed from the dataset (Table 2).

Table 2 Sample Demographic Information

Type of Institution	Program	n (% of sample)	Sex	Age Mean (SD)	PGY Mean (SD)
University Undergraduate	KSR	7 (10%)	F=5 M=2	21.71 (2.72)	2.57 (1.40)
	Pharmacy	5 (7.4%)	F=2 M=1	22.28 (2.91)	2.00 (1.15)
	Medicine	5 (7.4%)	F=4 M=1	26.31 (3.95)	1.20 (.989)
	ALES	5 (7.4%)	F=4 M=1	21.3 (1.65)	3.50 (.87)
	Nursing	2 (3%)	F=2 M=0	20.5 (0.51)	1.00 (X)

	Social Work	1 (1.4%)	F=1 M=0	24.0 (X)	1.00 (X)
University	RM	30 (45%)	F=25 M=5	25.2 (2.90)	1.08 (.475)
Graduate					
Polytechnical	RT	6 (9%)	F=5 M=1	22.67 (1.87)	2.5 (.77)
	ACP	1 (1.4%)	F=0 M=1	26.0 (X)	1.00 (X)
College	PharmTech	5 (7.4%)	F=5 M=0	21.01 (1.10)	1.5 (.50)
				23.79 (3.1)	
Total		N=67	F=55 M=12	Range = 19-33	1.83 (1.20)

KSR = Kinesiology Sport and Recreation, ALES = Agriculture Life and Environmental Sciences, RM =

Rehabilitation Medicine, RT = Respiratory Therapy, ACP = Advanced Care Paramedic, PharmTech = Pharmacy Technician

Results

1. Experiences, Influences, and Outcomes

On average, in the last week during training participants reported experiencing situations where they conformed to peers' behaviour 3.2 times and were obedient to an authority 2.3 times (Table 3).

The majority of the sample (84.6%) indicated they had carried out a task in the way a peer did when uncertain of the proper method; participants indicated they had often observed peers do the same (91%). When performing a procedure or technique participants felt peers frequently went with the crowd (53%) at a higher rate than themselves (27%); most participants

(60%) believed they only sometimes went with the crowd. Participants tended to feel somewhat confident in their knowledge when a peer disagreed with them (79%), a minority (6%) were completely confident.

Almost all participants (91%) had been in a situation where they followed the instruction of an authority feeling that they could not contradict the person, despite believing the person in authority to be incorrect. An equal number had a peer disclose being in a similar situation. Most participants (81%) indicated they had followed peers that were acting on instruction from an authority that the participant did not believe to be correct. Fifty-one percent of participants had been subjected to negative consequences for speaking up and 65% had witnessed peers being subjected to negative consequences for speaking up.

Table 3 Mean number of experiences with conformity and obedience

Time Frame	Conformity		Obedience	
	Self	Peer	Self	Peer
Past Week	3.2(2.2)	4.83(2.74)	2.29 (2.5)	2.57(2.4)
Past Month	8.11(4.96)	10.63(5.7)	4.33(3.9)	5.39(4.0)
Past Six Months	23.5(12.83)	26.75(17.53)	11.77(11.79)	16.2(12.96)

Note: Standard deviations are shown in parentheses.

Participants indicated Impression Management was a factor for obedience and conformity. Sixty-nine percent of participants had acted on incorrect instructions from an authority because of concern with how the authority would perceive them personally, with 68% reporting concern with how they would be perceived professionally. Participants indicated a high level of concern with being viewed as a typical member of their profession (60%) yet to a lesser

degree indicated a high level of concern with how peers would view them professionally (35%); a small number (10%) were never concerned with how others thought of them. Most participants felt it necessary to alter their behaviour (89%) and thinking (67%) to align with the behaviour and thinking of those around them. Almost all participants felt a need to “fake it until you make it” (94%) with many feeling that they often needed to do so (37%).

Displacement of Responsibility was frequently indicated as a factor in obedience with 66% of participants having followed the instructions of an authority because they did not believe that they themselves would be held personally responsible for the outcome.

Being obedient to an authority caused Moral Distress for participants. Acting on the instructions of an authority believed to be incorrect had caused distress for most participants (71%), with 51% having felt highly distressed and 13% extremely distressed. Similar distress was witnessed in peers (73%), with participants reporting peers had indicated they had been highly distressed (53%) and extremely distressed (6%).

2. Perceptions of Compliance

Responses to the open-ended item, asking students to share experiences and thoughts regarding conformity and obedience during their education and in their professional lives (see Appendix A), provide further insight into participant experiences. Four primary themes were identified in the responses: Desire for Smooth Interactions, Student-Instructor Dynamic, Experience and Knowledge as Supportive Factors, and Need for Education on Positive Deviance.

Desire for Smooth Interactions

Several of the participants stated that the avoidance of conflict and a desire for smooth interactions was a central reason to obey authority figures. Some participants stated that they

often go along with what the instructor says for the purposes of assessment. Participant's behaviour or actions would adapt for the clinical environment, but it is not 'worth it' to them to question their instructor's actions.

"I think that sometimes we may go with what an instructor says just because that is the way we are supposed to do it for the purposes of the course. Rather than speak out against what we think might not be the best way of doing something, we just learn it for the test and know we won't actually do it that way in practice"

(20-25-year-old, Occupational Therapy Student)

"One reason that I obey authority figures is that I do not want to start a loud argument or 'create a scene'"

(20-25-year-old, Dietetics Student)

Student-Instructor Dynamic

Participants mentioned the nature of the student-instructor relationship creates a power differential that creates discomfort with questioning authority.

"I find that power dynamics (e.g. Those between a senior faculty member and a student) make it very difficult to feel comfortable or able to question the authority figure. Conformity is often very hard to avoid in that sense, I have found."

(20-25-year-old, Kinesiology Student)

Experience and Knowledge as Supportive Factors

Students believed more experience and knowledge were a means to counterbalance obedience to authority. Having the confidence and comfort level to speak up and ask questions within a specific context was mentioned.

“I feel like a lot of my obedience was in years past and now I do feel more comfortable asking questions and clarifying before I do something. This is typically based on experience in the area.”

(26-30-year-old, Occupational Therapy Student)

Need for Education on Positive Deviance

A few participants expressed a need for education on dealing with situations of obedience; two forms of need were identified. First, participants commented that teaching students how to engage instructors who don't want to hear opposing ideas would better prepare students to manage situations where they need to question authority in potentially conflictual situations. Second, participants desire faculty development and education for instructors about positive deviance and the need to encourage questions and opposing beliefs from students to counteract obedience and create a learning space that allows for open discussion.

“It is difficult to say no or to oppose the beliefs of instructors that do not know how to handle hearing what they don't want to hear. More needs to be done to educate students on how to handle these conflicts.”

(20-25-year-old, Physiotherapy Student)

The participants' written comments indicate that students have experienced issues of obedience in the educational setting yet have found strategies to avoid the situation when they

did arise. With time (experience) and greater knowledge, they felt the frequency and/or impact of these situations would lessen.

Discussion

The results of the two research questions are integrative and supportive, with a general picture of compliance behaviour emerging. Within a health sciences education context, experiences with obedience and conformity are common and students are aware of some of the causes of compliance, yet often do not think that it is possible to engage in positive deviance.

Experiences, Influences, and Outcomes

Almost all participants had experienced conformity and obedience in their training. Most participants indicated Displacement of Responsibility was a factor in obedience, having acted on the instructions of an authority because they did not believe that they would be held personally responsible, aligning with the findings of other research (Bould et al., 2015; Delaloye, 2017; Sur et al., 2016). Though Displacement of Responsibility can be legally exonerating (Darley, 1995; Hamilton & Sanders, 1995) there is an additional moral responsibility beyond the legal one for people to engage in positive deviance when it is believed something inappropriate is occurring (Monrouxe et al., 2017). Further, when students displace responsibility and are obedient it can have a negative personal impact, namely Moral Distress, with its attendant negative outcomes. Interestingly, the reported experiences with obedience and conformity decreased as the time frame of recall increased. It is possible students may simply be unable to recall events as accurately as the time frame increases. Forgetting may also be a protective mechanism against Moral Distress; further investigation into a possible effect is merited. The desire for smooth

social interactions through Impression Management was also prevalent. The results from the survey items and common themes identified in the qualitative analysis identify Impression Management as an important factor in eliciting compliance in health professional students. The desire for smooth interaction can stem from concerns over the result of speaking up, or non-obedience, including ostracization, punishment, or being labelled negatively by those more advanced in a hierarchy, though reproach can also come from peers (Blenkinsopp et al., 2019). The prevalence of Displacement of Responsibility and Impression Management has important implications for patient safety. It is necessary to instill in learners the shared responsibility of all team members, from students to senior practitioners, for patient outcomes and that patient outcomes are ultimately more important than transient interpersonal aspects of a healthcare team. Establishing shared responsibility is important in the delivery of patient-centered care and avoiding negative compliance and engaging in positive deviance could have the benefit of preventing Moral Distress.

Perceptions of Compliance

The themes identified from the student comments helped to elucidate the results of the first research question. Though students may believe that something is wrong, they still engage in Impression Management as there is a *Desire for Smooth Interactions* by avoiding conflict. The desire to avoid conflict may depend on the personality of the student and instructors, the context of the situation, and potential future assessment. The avoidance of conflict is also related to completing curricular requirements and learning what is necessary for assessment. To an extent, compliance is necessary for education and students are willing to forgo conflict to learn required knowledge. The survey items indicating a concern for the perceptions of others and a need to be

viewed as a competent, typical member of the profession are supported by the reports of a desire for smooth interaction.

A student's level of *Experience and Knowledge as Supportive Factors* can facilitate students speaking up in situations when they observe something is wrong. As a person moves through their education and becomes more certain in their knowledge and their position in a healthcare team the person can feel more confident in challenging an authority. The validity of students' belief that experience will result in better performance is questionable when considering other research indicating compliance is prevalent across all levels of age and experience and expected behaviour is a poor predictor of actual behaviour (Ariely, 2008; Calhoun et al. 2013; Harley, Karlsen, & Loftus, 2004; Perugini & Leone, 2009; Pieters, Baumgartner, & Bagozzi, 2006; Shafir, 2002; Sunstein & Thaler, 2003; Zell & Krizan, 2014). The potential protective effect of experience and knowledge requires further empirical examination.

Participants may want to speak up but have a *Need for Education on Positive Deviance* to help them do so. The need for personal education extends to a desire for education for those in positions of authority to help the authority to be open to challenges. Students believe early instruction on compliance and positive deviance could be beneficial for when students are in future positions of authority so that they will not be as rigid as predecessors and will engage in open discussion with those in a lower hierarchical position. Education on these topics could be further bolstered by teaching Social and Cognitive Psychology in the health sciences curriculum, potentially in interprofessional courses (Royce et al., 2019; Sussman, 2019).

Educational Implications

The frequency of compliance has educational implications that could influence educational interventions targeted at reducing negative compliance and increasing positive deviance. In the healthcare literature there is growing attention to the fact a large part of a student's education, informally, is through the Hidden Curriculum (Hafferty & Castellani, 2014; Holmes et al., 2014; Raso et al., 2019). One of the key components of identifying, understanding, and conveying knowledge about the Hidden Curriculum to students is through formal educational means. Formal education that addresses the Hidden Curriculum includes providing information on specific outcomes that result from the Hidden Curriculum including compliance behaviour, how to identify situations of negative compliance and how to engage in positive deviance (Holmes et al., 2014; Kumar et al., 2018). Patient advocacy tools for engaging in positive deviance, such as the Advocacy-Inquiry approach, CUS (I am Concerned, I am Uncomfortable, this is a Safety Issue), and the two-challenge rule, and programs such as TeamSTEPPS, could be taught in conjunction with information regarding the Hidden Curriculum and the social and cognitive psychological causes of compliance (Chen et al., 2019; Clapper, 2018; Omura et al., 2017). A more thorough understanding of why it is difficult to engage in positive deviance and speak up may make the programs more effective and the tools easier to use.

People are predisposed to obedience to authority and group loyalty (Haidt, 2001, 2012) yet believe that they are not influenced by either (Doliński et al., 2017; Grzyb & Dolinski, 2017). Part of education on the Hidden Curriculum should emphasize the frequencies of experiences and that all students will experience compliance scenarios and with a high degree of likelihood will be compliant. More specifically, students should be informed of base rates and that despite a belief that they will be in the minority that speaks up, it is statistically impossible (Zell et al.,

2019). There are also implications for educators and administrators, it is necessary to make those in advanced hierarchical positions aware of how their actions have behavioural and psychological impacts on students. Increased awareness can be combined with recommendations for educators and administrators such as respecting and even requesting dissenting opinions. Leader inclusiveness demonstrating invitation and appreciation through words and deeds in an interdependent setting can promote psychological safety regardless of role status (Nembhard & Edmondson, 2006). The promotion of psychological safety can help change the Hidden Curriculum, and subsequently broader institutional culture, to create safe and supportive environments for positive deviance.

Limitations

There are two main limitations to the present study. First, there is a small sample size. Improved sample coverage would increase the validity of the interpretations of the frequencies of compliance in the population of health sciences students. Additionally, it is possible there was a response bias with students particularly sensitive to the issues being more likely to complete the survey. With the recognition of the sample size, the nature of the study is exploratory and was able to capture a diversity of professions in programs that range from certificates to graduate degrees from multiple institutions. Many of these disciplines have no research on compliance and the present study serves as an initial exploration into conformity and obedience for these disciplines. Furthermore, the results of the present research align with anecdotal evidence and experimental findings (Beran et al., 2014; Beran et al., 2013; Bould et al., 2015; Calhoun et al., 2014; Cosby & Croskerry, 2004; Kaba, Beran, et al., 2016; Liao et al., 2014; Sur et al., 2016; Sydor et al., 2013). Second, a related limitation is a large number of participants were from the Rehabilitation Medicine (RM) program. It might be argued the results are primarily

representative of RM, however, RM does cover several subdisciplines and no differences were found across any of the programs or institutions for any of the survey measures. The fundamental constructs of human behaviour are nearly universal, including compliance, and it is highly likely that the results of the present study will generalize to other samples and populations and similar results would be found (Avorn, 2018; Graham et al., 2011; Greene, 2015; Haidt, 2007, 2012; Pinker, 2002). The authors encourage broad multi-institutional replication to verify the generalizability of these findings (see Supplemental Material for a copy of the survey).

Conclusions

It was found that situations of obedience and conformity are commonly experienced across health science programs. The present study contributes to the existing literature by providing a measure of experiences of negative compliance integrated with relevant psychological theories. The present results provide further empirical support to the existing literature on negative compliance as well as why it occurs. Educational implications can be derived from this work including the need to make students aware of the likelihood that there is a tendency to be compliant in challenging scenarios despite personal expectations to the contrary. It was also identified that students desire more education on compliance and positive deviance.

The present study is an example of the integration of causative mechanisms with sampling of negative compliance and the challenge of speaking up. It is necessary for widespread replication of the present research with expanded sampling to determine the rates of conformity and obedience, as well as the attendant psychological variables, at the population level of health professional students in North America and globally. Extension should also include sampling of instructors and preceptor's knowledge and experiences of compliance. More data will produce normative rates and will allow contrast and comparison to help determine if

any single institution or program has an exceptional issue with negative compliance and evaluate the efficaciousness of educational programs in improving positive deviance.

Abbreviations: BTAE = Better than Average Effect, SPSS = Statistical Package for the Social Sciences, REB = Research Ethics Board, TeamSTEPPS = Team Strategies and Tools to Enhance Performance and Patient Safety, KSR = Kinesiology Sport and Recreation, ALES = Agriculture Life and Environmental Sciences, RM = Rehabilitation Medicine, RT = Respiratory Therapy, ACP = Advanced Care Paramedic, PharmTech = Pharmacy Technician

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CHAPTER IV: A BEHAVIOURAL STUDY OF OBEDIENCE IN HEALTH PROFESSIONAL STUDENTS

Chapter Summary: An experimental simulated compliance scenario was used to examine obedience to authority in Respiratory Therapy (40) and Advanced Care Paramedic (20) students. There was a significant effect for profession and cognitive load where RT students demonstrated lower levels of positive deviance in the low cognitive load scenario than students in the other conditions. While the writing task did not have a significant effect on participant behaviour several other variables, such as Ingroup Loyalty and ethnicity were identified for further investigation.

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Introduction

In the twenty years after the 1999 Institute of Medicine report, *To Err is Human* (Kohn et al., 1999), iatrogenic sources of death continue to be a major challenge globally (Cohen & Patel, 2020). One of the most prominent means to improve patient safety that has emerged is the focused integration of different healthcare professionals into cohesive teams through

Interprofessional Education and Collaborative Practice (IPECP) (Cosby, 2017; Frenk et al., 2010; Kohn et al., 1999; World Health Organization, 2010). IPECP has grown over the last two decades (Reeves et al., 2017), and is often presented as a panacea to numerous problems in healthcare. It has been proclaimed Interprofessional Education (IPE) is a great truth awaiting validation (Gilbert, 2013) and that the benefits of Interprofessional Collaboration (IPC) are clearly documented and the need for IPE in undergraduate and graduate education is supported by the literature (Wellmon et al., 2017).

“In practice, however, groups often fail to live up to their potential, largely because of social interactions that may constrain individuals from fully participating in generating ideas and sharing knowledge (Hill, 1982 in Croskerry, Cosby, Graber, & Singh, 2017 pp 213)

At present, the evidence is not so unequivocal. The literature does not demonstrate IPECP is uniformly beneficial, with mixed results for patient outcomes (Didier et al., 2020; Lapkin et al., 2013; McCutcheon et al., 2020; Paradis & Whitehead, 2018; Vuurberg et al., 2019) and with some aspects of IPC being negative (Beran et al., 2014; Kaba et al., 2016). For instance, conformity to group influences can lead to the misreporting of vital signs (Kaba, Beran, & White, 2016). Concerns for patient safety and a focus on IPECP has led to long existing issues in healthcare education and practice being brought to light, in particular communication in hierarchies and the ability to challenge colleagues when something does not seem right (Green et al., 2017; Pian-Smith et al., 2009). In healthcare, group communication and team interactions have historically not been well investigated (Cosby, 2017). However, a growing body of research reports issues with compliance through hierarchies and professional cultures (Alingh et al., 2019; Holmes et al., 2014; Mak-van der Vossen et al., 2018; Martinez et al., 2017; Pattni et al., 2019;

Peadon et al., 2020; Schwappach et al., 2019), conformity and peer pressure (Beran et al., 2015; Beran et al., 2013; Kaba, Beran, et al., 2016; Kaba & Beran, 2016) and authority (Bould et al., 2015; Calhoun et al., 2014; Delaloye et al., 2017; Friedman et al., 2015; Kuo et al., 2020; Shanks et al., 2020; Sydor et al., 2013).

While these aspects of group dynamics can be determinantal, the situation is complex as hierarchies, professional cultures, conformity, and obedience to authority can be necessary for learning and professional practice. A detrimental effect of group dynamics occurs through negative compliance: the potential negative consequences that can arise from deference, yielding, or complying with others (Delaloye, 2017) or when a person does not speak up or alter a course of action believed to be inaccurate or unsafe (Green et al., 2017). Negative compliance can function broadly through Groupthink and more specifically through conformity and obedience to authority (Kaba et al., 2016). In the healthcare literature the behaviours that comprise negative compliance have not typically been termed as conformity and obedience but are discussed generally as ‘barriers to speaking up’. Though the literature on negative compliance is nascent, strong effects have been shown (Pattni et al., 2019; Peadon et al., 2020). As interdependence and teamwork amongst health disciplines increases it is important to study Conformity and Obedience to understand how interprofessional teams can fall short of the ideal and produce negative patient outcomes (Hémon et al., 2020; Kaba et al., 2016). Examining the negative aspects of teamwork, along with the positive outcomes, is prudent for determining how IPECP can exacerbate the issues IPECP has been posited to solve.

Existing research on compliance has largely focused on interactions between physicians and nurses (Blenkinsopp et al., 2019; Pattni et al., 2019; Peadon et al., 2020) leaving other health professions, in particular students in allied health professional programs, as an under researched

group (Milligan et al., 2017). Understanding how compliance and difficulties in speaking up affects other essential members of the healthcare team (Milligan et al., 2017; Peadon et al., 2020), such as Respiratory Therapists (RT) and Advanced Care Paramedics (ACP), and students in other allied health professions, is important to fully comprehend team dynamics among all members of interprofessional teams in hospital and prehospital environments. Some studies on teamwork and speaking up have included RT's (Pattni et al., 2019) though literature on practitioners such as ACP's is absent (Kilpatrick et al., 2020). It is necessary to develop knowledge about how students outside of medicine and nursing with different roles and positions in the healthcare hierarchy are affected by compliance.

Compliance

Group dynamics, situations where two or more people interact for a common purpose (Tasca, 2020), have a long history of study in psychology and are ideal for studying compliance in health care teams (Beran, 2015; Kaba et al., 2016; Lewin, 1947a, 1947b; Weiss et al., 2014). Compliance is operationalized as “A particular kind of response—acquiescence—to a particular kind of communication—a request. The request may be explicit... or it may be implicit” (Cialdini & Goldstein, 2004). The explicit request can be overt using forceful or nonforceful means, while the implicit can include social forces that are subtle, indirect, and nonconscious (Cialdini & Goldstein, 2004). The forces used can be real or imagined and create internal or external change in a person (Barrett, 2017).

Mitigating negative compliance is difficult as much of human psychology, including obedience and conformity, is generally non-conscious (Cialdini & Goldstein, 2004; Haidt, 2001). Obedience and conformity are ecologically rational social-cognitive heuristics that function well for solving cognitive and social problems when considered against commonly encountered

cognitive and environmental constraints (Campitelli & Gobet, 2010; Gigerenzer, 2010; Gigerenzer & Goldstein, 1996). Compliance is a survival mechanism that is very difficult to break from (Friedrich, 1993). Cognitive Load, Individual Characteristics, and Displacement of Responsibility, among other variables, function as constraints that make breaking from compliance difficult.

Cognitive Load

Cognitive Load Theory (CLT), how memory and learning is influenced by different stimuli, is a leading model in educational psychology, and is generalizable across domains (Szulewski et al., 2021), yet in compliance research, is a long-standing under-investigated variable (Baker, 2019; Baron et al. 1996). Cognitive load may be particularly important for compliance scenarios in healthcare where numerous external stimuli can increase cognitive load (Sewell et al., 2020). If practitioners are experiencing high levels of cognitive load, it may be difficult to access adaptive structures or tools for speaking up as automatic and effortful modes of processing are interrupted and situational awareness is reduced (Elfering et al., 2015; Grzyb et al., 2018). Delaloye (2017) found deferring to authority allowed healthcare professionals to manage cognitive load and focus on a single task.

Individual Characteristics

The influence of individual differences on speaking up has been examined to varying degrees with indeterminate findings related to personality traits, confidence, self-efficacy, and profession (Daly Guris et al., 2019; Barzallo Salazar et al., 2014; Kuo, et al., 2020; Oner, et al., 2018; Roussin et al., 2018; Sydor et al., 2013). In general, sex differences are not influential in

obedience to authority (Blass, 1999); though contexts may exist where sex differences are important (Pattni et al., 2017; Roussin et al., 2018).

A previously unexamined, though potentially informative theory for understanding individual differences is Moral Foundations Theory (MFT). MFT is a predominant theory in moral psychology with strong evidentiary support. MFT suggests that rather than engaging in careful moral reasoning humans are moral intuitionist (Graham et al., 2018; Haidt, 2001; Mikhail, 2021). The moral intuitionist perspective is that moral reasoning is post-hoc and follows intuitive moral judgment, rather than moral reasoning producing moral judgment through a process of ratiocination. Moral judgments are influenced by individual dispositions and cultural variability on five foundational moral intuitions: Harm/Care, Fairness/Proportionality, Purity Sanctity, Ingroup Loyalty, and Respect for Authority (Haidt, 2012). Moral intuitions are quick, effortless, and automatic thoughts, otherwise known as heuristics (Gigerenzer, 2010). In particular, Respect for Authority is an adaptive heuristic for the complex and dynamic social systems that govern social functioning and can have a strong influence in affecting obedience to authority (Graham et al., 2018). MFT is useful for understanding medical errors by providing a basis for examining how cognition unbeknownst to the human actor that produces a disposition towards obedience, may influence behaviour.

Displacement of Responsibility

People may obscure or minimize an agentive role in harm by viewing their actions as stemming from the dictates of an authority, this is motivated reasoning known as Displacement of Responsibility (Bandura, 2002). Displacement of Responsibility has been consistently identified as one of the most important variables for creating obedience to authority (Bandura, 1999; Richardot, 2014). The effect also appears to be present in the context of healthcare. In

compliance scenarios the Displacement of Responsibility has been identified as preventing action by causing people to feel less responsible and become “agents of their leader.” (Bould et al. 2015; Friedman et al., 2015).

Mitigating Negative Compliance

To mitigate negative compliance caused by obedience, it is necessary to enact Positive Deviance (PD). Positive Deviance is effectively taking action to prevent harm and negative consequences to a patient and counter behaviour that erodes professional values or creates negative outcomes (Blanton & Christie, 2003; Holmes et al., 2014). The action is “deviant” because it is taken regardless of whether others take the action or if the action is socially supported or reinforced (Blanton & Christie, 2003; Holmes et al., 2014). Positive Deviance can occur through speaking up or challenging authority (Pattni et al., 2019) or may include other actions such as adhering to procedures when others do not. Promoting PD involves helping students or health professionals resist pressure to enact unsafe or unprofessional practices (Holmes et al., 2014). To date the interventions developed to promote PD, including speaking up, have proven inconsistent and variable (O’Donovan & McAuliffe, 2020).

Ariely (2008) popularized the idea that, though people are not rational, they are “predictably irrational”. People’s biases, misjudgments, heuristics, causal inferences, and cognitive illusions function in similar and highly predictable ways. If a person’s behaviour is predictable then it can be targeted, and the locus of change and intervention should be placed on the individual rather than primarily on broad social and professional structures (Bainbridge & Regehr, 2015; Holmes et al., 2014). In other words, effectively promoting PD might best occur through targeting individual’s behaviour.

To modify individual behaviour change should focus on a lower level of cognition, the person's self-concept. Self-concept change can influence a person's beliefs, attitudes, perceived control, and subsequent behaviour (Hogarth, 2001). Self-concept change can be enacted through the principle of consistency (Cialdini, 2006). Self-concept is maintained by consistent behaviour and will modify a standard intuitive response (Cialdini, 2006). Behaviour not aligned with the self-concept will create cognitive dissonance (Festinger, 1957; Festinger & Carlsmith, 1959; Mcgrath, 2017) and threaten self-esteem. The inherent desire and need to protect self-esteem can be resolved by acting to protect the self-concept (Greenwald et al., 1988; Pyszczynski et al., 2004). A person may enact PD by speaking up or taking action to resolve a situation if their self-concept is modified so that being obedient when they perceive something is wrong becomes a major threat to their self-esteem. In other words, engaging in PD produces benefit for the person through reducing dissonance by aligning their behaviour with the self-concept of being someone who speaks up. Consistency is created, and self-esteem and self-concept are maintained. Undesirable obedience is altered through the positive application of consistency of thought and behaviour, a guiding principle of human cognition (Cialdini & Goldstein, 2004) and one of the most basic social heuristics (Bocchiaro & Zimbardo, 2017).

A simple method to achieve self-concept change is through a writing task. If the initial action for a change was active, effortful, and viewed as internally motivated, the creation of a need for consistency will be most effective (Cialdini & Goldstein, 2004; Cialdini & Trost, 1998). To create the internal motivation and change in self-concept, a writing task can elicit effortful activity. Expressing a certain position formally through writing or speech, particularly if the position is made public, will cause a need for behaviour or thought that is consistent with the expressed opinion (Cialdini, 2006). Defending or espousing a certain position, whether the

position was taken voluntarily or involuntarily, can cause a person's beliefs and attitudes to shift towards the position taken (Gastil et al., 2008; Schug, 1954; Wojcieszak, 2011). With a shift in belief and attitude comes a change in self-concept to the extent that to be consistent and maintain self-concept the person will have to modify their behaviour. With a writing task, the self-concept change would occur by having students write about the possible harm that can occur to a patient if the student follows incorrect instructions or fails to speak up when observing an action they believe to be inaccurate or harmful. Students would also write about what they would do to ensure the patient was not harmed.

Purpose of the Study

The present study will focus specifically on how the social-cognitive heuristic of obedience to authority creates negative compliance in the context of an interprofessional team. This study will examine three facilitating variables for obedience in the context of an interprofessional team: cognitive load, individual characteristics including the disposition to Respect for Authority, and Displacement of Responsibility. An interventional writing task intended to improve PD through self-concept change will also be tested. Understanding the variables that create compliance in interprofessional teams can improve understanding of how the environment and individual interact and how efficient evidence-based change can be instituted.

Research Questions

To fulfill the study purposes two sets of research questions were developed:

Primary

1. Will Respiratory Therapy and Advanced Care Paramedic students demonstrate Positive Deviance in a simulated clinical scenario?
2. Will high cognitive load decrease the rate at which students demonstrate Positive Deviance, conversely will high cognitive load increase Obedience?
3. Can a brief writing task increase the rate at which participants demonstrate Positive Deviance, conversely will the intervention decrease obedience?

Secondary

1. Will any individual characteristics be predictive of Positive Deviance?
2. Will Displacement of Responsibility inhibit Positive Deviance?
3. What insights can be obtained regarding Obedience and Positive Deviance through observation of the simulation scenarios designed to enact obedience?

Methods

Design

The study used a 2x2 factorial experimental design. The manipulated variables were Cognitive Load (High/Low) and a Writing Task (Intervention/Control). The study was conducted using a simulated airway management scenario where the participant would be assisting a senior physician with a difficult intubation. The situation would become dangerous for the patient as the physician persisted with obtaining the airway. Rates of PD were measured through direct observation of the simulation. To elicit authentic behaviour during the simulation, deception was used. Participants were told the research was part of a personality study intended to develop individualized learning for simulation training. Participants were debriefed after the simulation

and the full nature of the study was revealed including the purpose of the writing task and the reason for using deception. At the end of the debriefing participants were checked for discomfort and consent was reaffirmed. The study was conducted during the 2019 Winter Semester and was approved by the Northern Alberta Institute of Technology Research Ethics Office and the University of Alberta Research Ethics Board 2.

An airway management scenario was selected as it has been previously shown to be practical for examining PD (Pattni et al., 2017) and airway management is an important aspect of patient safety. Failure to intubate and resultant hypoxemia is an important factor for error in care and a major cause of morbidity and mortality (Griesdale et al., 2012; Langeron et al., 2018).

Participants

Participants were recruited from the second-year RT cohort, 40 students, and first-year ACP cohort, 20 students, at the Northern Alberta Institute of Technology. Both groups are experienced with simulation training and have uniform knowledge in performing airway management tasks. Approximately two weeks prior to the first stage of the study, participants had performed instructor-led lab scenarios requiring them to speak up and advocate for patient safety during a critical incident. Participants were recruited during class time to participate in the study and time normally allotted for simulation training was used for the study. Students were informed that participation was voluntary and choosing not to participate would have no influence on their grades or academic standing.

Materials

Writing Task The interventional condition for the writing task was designed as described in the introduction to cause a person to see themselves as someone who engages in PD. A neutral

writing task was developed as a control. Participants were asked to not discuss the writing task with their peers. Three different neutral writing tasks were used in the case that participants did discuss the writing task it would not be obviously apparent there was an intervention and control writing task. The control writing task included either writing about a favourite summer vacation, a favourite place to study, or a favourite pastime outside of school. The intervention and control writing tasks were ostensibly for the purpose of personality assessment (Küfner et al., 2010) as a part of the assessment of personality for individualized simulation learning.

Individual Measures the Moral Foundations Questionnaire (MFQ), specifically the Respect for Authority subscale, was used to measure individual's disposition to obedience. The MFQ has demonstrated good overall validity evidence, for example reliability scores on the binding and individualizing scales have been measured at .83 and .78 respectively. At present the MFQ is the best scale for assessing Respect for Authority (Doğruyol et al., 2019; Graham et al., 2018; Matsuo et al., 2019; Nilsson & Erlandsson, 2015). The remainder of the survey collected data on age, sex, GPA, experience and confidence with airway management, clinical and simulation experience, and post-secondary education.

Cognitive Load High Cognitive Load (HCL) was created by having a Standardized Patient (SP) play a distressed family member of the patient. To increase cognitive load for the participant, the actor was instructed to appear distraught and emotional, to question the participant and the doctor, to demonstrate concern for the patient's well-being, and to speak to the patient. All family members were females between the ages of 40-60 and were instructed to indicate they were the patient's sister.

Doctor The doctors were played by SPs. All actors were Caucasian males, between 40-60 years old, approximately 5'8 to 6 feet tall, and were selected to have an authoritative appearance.

Prior to the simulation each actor was trained how to perform an intubation and given as many practice attempts as needed to feel comfortable. A full walk through of the simulation was done with the doctors and family members. The doctor wore an earpiece to receive instruction from the facilitator.

Patient The patient was a CAE Healthcare iStan Mannequin (CAE Healthcare, 2017). All participants were familiar with and had practiced on this model of mannequin.

Outcome measure

Positive Deviance was defined as the participant making a direct or explicit challenge to the doctor. For a challenge or speaking up to be an effectual intervention it is necessary to be direct or explicit (Garden & Weller, 2017). For example, a direct challenge could include a statement that what was occurring was unsafe, that the doctor needed to stop, that the participant was going to stop the doctor, that harm was being done to the patient, or making a statement about changing the course of action in an assertive tone. The potential approaches to PD, or speaking up, are diverse (Okuyama et al., 2014; Omura et al., 2017) including the two-challenge rule and using an advocacy-inquiry approach (Pian-Smith et al., 2009). As there is no uniformly accepted method for engaging in PD, there were no specific phrases alone that were considered to constitute PD, however, the operationalized definition for the study aligns with the final two levels of the Modified Advocacy-Inquiry Score (mAIS) (Sydor et al., 2013). The mAIS has been used to score challenges in a continuous manner (Delaloye et al., 2017; Friedman et al., 2015; Pattni et al., 2017; Pian-Smith et al., 2009; Sydor et al., 2013). The lower levels of the mAIS constitute questions or suggestions. In the present study PD was measured as a binary action, yes or no, for this study a lower-level action was not considered PD. Questions or suggestions directed towards authority or over hierarchical gradients are easier to make as well as dismiss

(Islam & Zyphur, 2005; Richardot, 2014). While a direct challenge is more difficult to enact, it removes ambiguity and is more effective in eliciting change (Bandura, 1999).

Procedures

The study was conducted in two stages. Stage One: one week prior to the simulation, participants were provided with a link to the consent form, study information, demographic questionnaire, Writing Task, and MFQ, hosted on Qualtrics (Qualtrics, Provo Utah). Participants were given class time to complete the materials. The Writing Task was framed as a personality assessment to understand how different personality types learn in simulation. Participants were randomly assigned to receive either the intervention or a neutral condition. The intervention condition involved writing about how medical errors could occur due to obedience and what action the person would take to prevent such an error. The neutral condition involved writing about either a vacation, studying, or favourite past-time activity. Three neutral conditions were used so that, in the case participants discussed the writing task prior to the simulation, it would not be apparent there were two conditions, and the true nature of the study would be realized (see Supplemental Material for further detail). Stage Two: one week after Stage One, participants completed the simulated clinical scenario. Participants were sequestered in a waiting room and brought into the simulation center individually. After completing the simulation, participants were debriefed in a separate room and sent out through an alternate exit so that they would not encounter participants who had not yet completed the simulation. Four simulations ran concurrently. All simulations and debriefings were audio and video recorded for analysis. The scenario flow is shown in Figure 1 (for full procedures and description of the simulation please see the Supplemental Material).

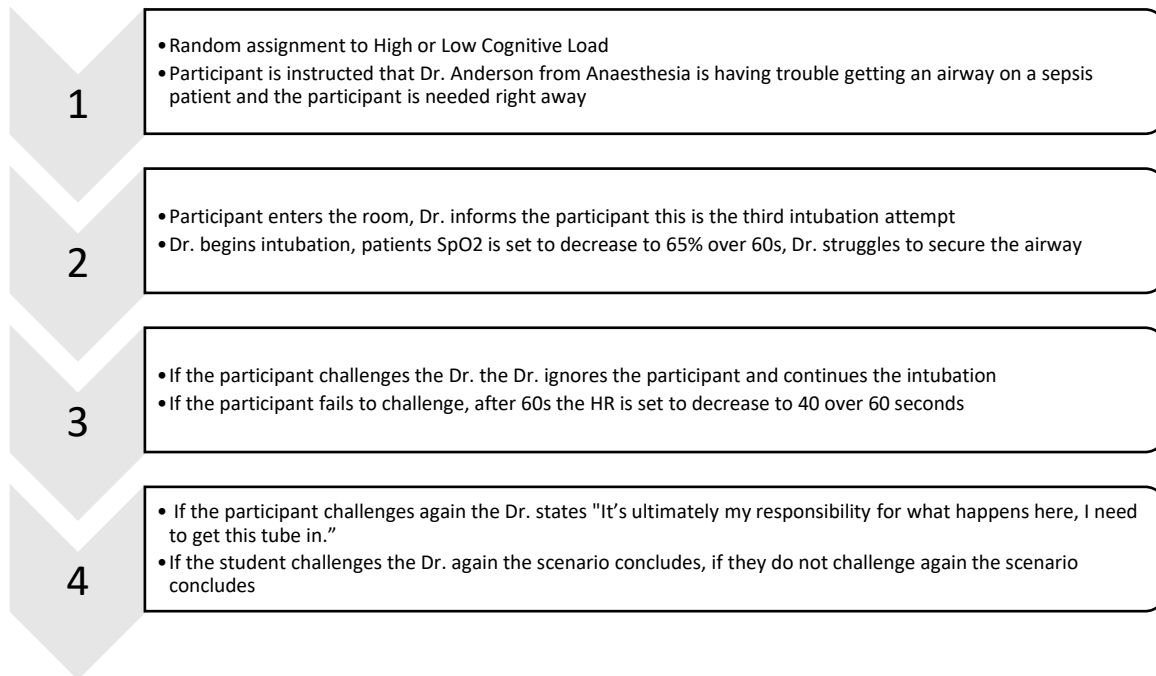


Figure 1. Simulation scenario flow for the experiment.

The deterioration in vital signs is similar to procedures used by Pattni et al. (2017); however, to maintain an open environment, there were no specific points where a challenge and reply was expected, thus the participant was able to challenge the doctor at any time during the simulation. The actor playing the physician was instructed to ignore or brush off questions, offers for help, or suggestions. The actor wore an earpiece and was instructed by facilitators who were program instructors experienced with simulation, airway management, and the need for PD, as to when to use the responsibility phrase: "It's ultimately my responsibility for what happens here, I need to get this tube in." The actor would be persistent in trying to intubate the mannequin regardless of the participants behaviour. A soft time limit of two minutes was placed on the simulation. The facilitator was given discretion to allow the simulation to run longer if it appeared the participant would make a challenge or if there was an interesting interaction occurring.

Analysis

Primary Analysis As there were two categorical predictors and a categorical dependent variable (PD or no PD), log linear analysis was used. Educational Program was included in the analysis as a possible confound. Odds Ratio were used to determine the effect sizes for the two independent variables (IV). A sample size of 60 is adequate for this form of analysis (Stelzl, 2000). Post-hoc calculations conducted using GPower (Faul et al., 2007) indicate a power level of .87. Primary analysis was conducted in jamovi, a point and click interface for R (jamovi, 2020).

Secondary Analysis The data mining/machine learning techniques of Elastic-Net regression (James et al., 2013; Zou & Hastie, 2005) was used to train a model to determine predictors of PD. Elastic-Net regression is ideal for situations where the number of predictors is high relative to N and is advantageous over other variable selection methods (Hong et al., 2020; James et al., 2013). Analysis was conducted using the caret package (Kuhn, 2019) and glmnet package (Friedman, Hastie, & Tibshirani, 2010) in R (R Core Team, 2019). Two models were trained with different resampling methods, one using 5-fold Cross-Validation (CV) with 5 repeats and one using Bootstrapping. A tuning grid was set for alpha from 0-1 and lambda from .0001-1 with a search length of 100.

Observational Analysis Videos were analyzed using a semi-structured observational approach by two observers. Observers conducted the analysis independently and were blind to the randomization of the writing task. Some behaviours were coded to obtain quantitative measures, such as the number of questions or suggestions and the number of times participants read the blood oxygen saturation. A naturalistic approach was taken for observing any distinct

cases, behaviours, or outcomes from the simulations. After independent analysis, the observers compared results for convergence.

Data Preprocessing

Data were checked for careless responding. There were no inordinately fast completion times for Stage One. All participants completed the writing task with good detail.

Two deception checks were used to determine if participants suspected the true purpose of the study. First, at Stage Two, prior to the simulation, participants were asked to identify any familiar names from a list. The list included several famous psychologists including Milgram, Asch, and Zimbardo, known for their work on compliance. Second, after the simulation, during debriefing, participants were asked if they had any suspicion about the true nature of the study. Two participants recognized the name Milgram, one of whom indicated they had no suspicion about the true nature of the study, and the other indicated some suspicion based on the writing task. Both participants engaged in PD; however, they were not exceptionally fast in their time to PD and didn't demonstrate any behaviour exceptional from the other students, so the participants' data was retained. One participant, a Paramedic, indicated they had a degree in psychology and had guessed the purpose of the study, and expected the simulation to be about challenging authority. This participant's data were dropped from the study.

Assumptions of log-linear analysis were assessed prior to analysis. The data came from a random sample of a multinomial and mutually exclusive distribution with all observations being independent (Howell, 2010). The sample size of 15 per cell was adequate for the number of variables being assessed. The expected cell frequencies were also adequate, i.e. all cells contained >5 (Howell, 2010). Videos were coded for PD by two independent raters. Coders also recorded if PD was engaged in after the physician indicated it was his responsibility for what

happened, the number of questions or suggestions a participant made, and the number of times the participant read the Sp02. For PD, initial agreement between the coders was 51/59 (86%), Kappa = .67, Rater bias ratio = .44 $\chi^2 = .11$, $p = .739$. An iterative process of re-coding and discussion was engaged after which there was 100% agreement.

Results

Demographics

There was a final total of 19 participants from the ACP program and 40 from the RT program with 28 Females (2 ACP, 26 RT) and 31 Males (17 ACP, 14 RT). Over half of the sample identified as being of Caucasian/European descent 37 (63%), 9 (15%) as Chinese, 5 (8%) as South East Asian, 3 (5%) as an ethnicity not identified on the survey, 2 (3%) of Indian descent, and one each (2%) of Aboriginal, Middle East, and African descent.

Table 1. Demographic Characteristics of the sample

		Age	GPA	Yrs of Post Secondary Ed	Hrs Trained in Simulation	Weeks of Clinical Experience	Hrs of Exp with Airway Management	Experience with AW Management*	Confidence with AW Management ^a
ACP	Mean	28.2		3.47				3.26	3.37
	(SD)	(5.56)	3.90 (.17)	(1.65)	45.2 (41.3)	37.6 (31.8)	30.3 (13.4)	(.73)	(.68)
	Median	27 [21-	4 [3.44-	3 [1-6]	25 [3-100]	31 [1-100]	30 [9-60]	3 [2-4]	3 [2-4]
	[Range]	45]	4.00]						
RT	Mean	24.5		4.13				3.23	3.15
	(SD)	(5.97)	3.64 (.43)	[2.09]	94.3 (112)	5.95 (16.4)	70.4 (27.3)	(.77)	(.74)
	Median	23 [19-	3.8 [2.50-	4 [1-9]	50 [0-350]	2 [1-100]	77	3	3
	[Range]	45]	4.00]				[23-100]	[1-4]	[1-4]
Overall	Mean	25.7		3.92					
	(SD)	(6.04)	3.72 (.38)	(1.99)	78.2 (97.4)	15.9 (26.7)	57.5 (30.02)	3.24 (.75)	3.22 (.72)

Median	24.0 [19-	3.9 [2.05-			2.00 [1-	50 .00 [9.0-		
[Range]	45]	4.00]	3.00 [1-9]	50 [0-350]	100]	100.0]	3 [1-4]	3 [1-4]

* Rated on a 1-5 Likert scale: 1 - Not at all Experienced to 5 - Very Experienced

^a Rated on a 1-5 Likert scale: 1 - Not at all Confident to 5 - Very Confident

ACP students had more clinical experience than RT's, while RT's had more experience with airway management. Both groups were comparable on self-rated experience with airway management and confidence with airway management (Table 1). For sample scores on the MFQ see Table 2.

Table 2. Sample scores on the Moral Foundations Questionnaire

	Harm/Care	Fairness/ Proportion ality	In Group Loyalty	Respect for Authority	Purity/ Sanctity	Overall
Mean (SD)	22.6 (4.36)	21.1 (3.81)	17.5 (4.51)	17.3 (4.24)	13.2 (5.87)	18.3 (3.27)
Median [Range]	23 [11-30]	22 [11-28]	18 [8-16]	17 [8-27]	11 [3-26]	19 [11-26]

Primary Analysis

Overall, 38 (64.4%) participants engaged in PD, while 21 (35.6%) did not engage in PD (Table 3). A hierarchical four-way log-linear analysis was conducted to examine the effect of Cognitive Load and the Writing Task on PD, with Program as a confound. A significant overall model was identified, $\chi^2(15) = 33.9, p = .004, R^2_{CS} = .88$. There were no significant effects that included the Writing Task. A significant two-way interaction of Cognitive Load x PD was found $\chi^2(1) = 11.97, p = .005, z = -2.81$, along with a significant two-way interaction of Program x PD $\chi^2(1) = 5.19, p = .023, z = -2.03$. The three-way interaction for Cognitive Load x Program x PD was non-significant $\chi^2(1) = 2.84, p = .09; z = -2.04$.

To determine the specific effect of Cognitive Load and Program, follow up Chi Square tests were performed. No significant difference in PD was found for ACP students on Cognitive Load, $\chi^2(1) = 1.02, p < .31$; Odds Ratio (95%CI) = .29(.02-.35), $\phi = .23$. A significant difference of Cognitive Load was found for RT students with less PD in the LCL scenario, $\chi^2(1) = 12.38, p < .001$; Odds Ratio(95%CI) = .08(.02-.36), $\phi = .57$.

The results indicate that the Writing Task had no influence on PD. RT students in the LCL condition were less likely to engage in PD than in other conditions. In the HCL condition students were equally likely to engage in PD.

Table 3. Rates of positive deviance by conditions

Engaged in Positive Deviance					
Condition	Program	Yes		No	
HCL	ACP	8	25	1	4
	RT	17		3	
LCL	ACP	7	13	3	17
	RT	6		14	
		38		21	

Secondary Analysis

Predictors

The Elastic-Net regression identified several variables predictive of the likelihood of engaging in PD. The CV and Bootstrapping models were generally comparable though CV produced a sparser model with a higher classification Accuracy (SD), 74% (12%), and Kappa

(SD), .38(.29), than Bootstrapping 70% (12%) and .28(.27). Results of the CV model are shown in Table 4.

Table 4. Results of Elastic Net Regression with 5-fold Cross Validation *

Variables	β
Age	-.004
East Indian Ethnicity	.81
Middle Eastern Ethnicity	-1.25
South East Asian Ethnicity	-2.32
Confidence in AW Management	-.84
Hours Experience in AW Management	-.02
Harm/Care	.07
Fairness/Proportionality	-.05
In Group Loyalty	-.14

* $\alpha = .80$ $\lambda = .04$

Displacement of Responsibility

Twenty-one participants did not successfully challenge after the responsibility phrase was used. The responsibility phrase was not consistently applied by the actor, in several cases, the actor used the phrase on the first challenge or towards a question or suggestion. Despite inconsistent use, all of the 21 participants who did not successfully challenge heard the phrase at some point. Twenty-eight participants who successfully challenged did so after the doctor used the responsibility phrase.

Ten participants challenged the doctor in a manner that constituted PD before the doctor was able to use the responsibility phrase. These participants' challenges occurred very quickly and directly, either not giving the doctor the opportunity to use the phrase or continuing the challenge while the phrase was being uttered.

Observational

Six primary insights were obtained through analysis of the video data: 1) Types of Behaviour, 2) Avoiding Conflict: Making Suggestions and Asking Questions, 3) Displacement of Responsibility, 4) Positive Deviance, 5) ACP and RT Differences, 6) Physical Behaviour & Reactions. These insights inform findings from the primary and secondary analysis and provide further understanding of compliance. The mean time (SD), median (Interquartile Range[Range]) in seconds for the simulation was 93(34), 86.5(69-114[35-200]) s. For successful PD, the mean time was 77(23), 75.5(59-89[35-136]) s, for unsuccessful PD the mean time was 123(31), 118(102-143[73-200]) s.

1) Types of Behaviour

Four general types of behaviour were identified across the simulations.

Direct action – participants enter the simulation and immediately attempt to ascertain what the problem was, quickly realize the doctor was struggling, and the patient's condition was deteriorating. The participant would immediately start questioning the doctor's actions or suggest a different course of action. When the participant challenged the doctor and the challenge was rejected, the participant would persist in engaging in PD.

Delayed action/Realization – participants would enter the simulation and ask what they could do or how they could help, but would not do so with urgency or not immediately go to the

bedside. The participant might engage in non-task relevant actions. Once the participant realized what was occurring, they would directly engage the doctor. Participants would be persistent in their questions and suggestions, but not all would move to PD. Action might be spurred by the family member's distress.

Inaction – participants initial behaviour was similar to Delayed action/Realization. When the participant realized the doctor was struggling and the patient was deteriorating, they would not respond with urgency or if their questions or suggestion were rebuked, they would draw back. The participant might continue to ask questions or make suggestions in a non-forceful manner, but would not attempt to change any course of action. For example:

*"Sats are at 70, how are you doing? [Doctor: I'm fine. Long pause] how are you doing?
[Doctor ignores participant, participant is standing by the side of the bed away from the Dr with their arm resting on bedrail] did you want me to start bagging? [Doctor: No] ok [long pause] heart rate is below 40 and there is no respiratory rate [Doctor ignores participant, participant lowers bed rail and moves further back, participant does not move until the simulation is ended]"*

Participant #91928 RT Student

Frustrated Inaction – participants initially behaved like the Direct action or the Delayed action/Realization participants. When the participants initial questions, suggestions, or challenge were rebuked, the participant would continue with questions or suggestions, however, would not make a direct challenge. As the doctor continued to ignore questions or suggestions, the participants would become visually and audibly frustrated. The participant would try to challenge the doctor but would not move beyond suggestions or questions. For example:

"If you can't get this next one here I have qualification for intubation [Doctor: responsibility phrase] ok, yah, I, I understand sir [participant moves around the bed. Family member to student: do you know what to do?] yah I do [sharp and frustrated voice, does not challenge the doctor further]

Participant #10000 ACP Student

2) Avoiding Conflict: Making Suggestions and Asking Questions

All participants realized that what was occurring was incorrect and that the patient was in danger, yet many participants' behaviour was characterized by a desire to avoid conflict. The desire to avoid conflict was apparent in how participants approached the doctor. Participants would ask questions or make suggestions to the doctor; however, they would not make a direct challenge. The questioning and suggesting would carry on and the frequency of the questions and suggestion would increase or the tone of participants voices would change, yet participants struggled to move to a direct challenge. Participants questions and suggestions were characterized by words like "should", "would" "could", and "probably", "maybe", and "I think"; in other words, they used low mAIS statements.

Almost all participants read the blood oxygen saturation (sats) and heart rate out loud. Participants who engaged in PD averaged 3 suggestions or questions and 3 sats readings. Participants who did not engage in PD averaged 4 suggestions or questions and 5 sats readings. Several participants almost exclusively read the sats to the exclusion of any other behaviour.

Interestingly, there were cases in the first simulations where, due to the SP's uncertainty, the doctor was very obviously performing the intubation incorrectly. In some of these cases participants would point out what the doctor was doing wrong yet would not directly challenge:

[Participant makes a few hesitant moves forward while holding bagger] "can I... [trails off], the tube looks like it's the wrong way"

Participant #88821 RT Student

"Shouldn't the laryngoscope go down her throat?"

Participant #10001 RT Student

Examples of questions or suggestions used by participants:

[Participant standing back from the bed with hands clasped in front of their body] "Her oxygen sats are at 74% [Doctor: we're good] I think that's a little low"

Participant #60698 ACP Student

[Participant picks up bagger and stands beside the doctor] "umm, I'm thinking we should hyper-oxygenate, just get her back up real quickly [Doctor: it's fine] are you sure... [participant trails off], do you need the bed higher or anything"

Participant #54578 RT student

3) Displacement of Responsibility

Some participants were strongly influenced by the doctor's responsibility phrase. Most participants would continue with questions or suggestions after the doctor made the statement; however, some participants would almost completely disengage from any action, questioning, or suggestions.

"The sats are 60 and they're dropping, can we just, can we [Doctor: responsibility phrase] yah ok" [spoken very softly and participant backs away from the bedside]

Participant #10001 RT student

"We need to bag her up [Doctor: responsibility phrase] ok [participant backs away, moves forwards and back several times with hands crossed in front of body becoming visibly uncomfortable]

Participant #48456 RT Student

4) Positive Deviance

The shift from questioning, suggesting, and offering help to PD was often distinct and included a change in the participants tone of voice. The participants would become distinctively more assertive and phrases, though structured as questions or suggestions, would become statements prior to the actual PD, for example, "ok if they're down to 70 we should pre-oxygenate", "can we please bag?". Not all participants engaged PD assertively; some participants maintained an even tone of voice while making it clear that the doctor needed to stop. Others maintained a degree of deference while attempting to engage in PD, for example,

"Can I kind of stop the intubation here sir I honestly think it would be in the best interest of the patient, I hate to be pushy"

Participant #83695 RT Student.

Several participants made physical contact with the doctor after being ignored. Some participants gently placed their hand on the doctor's shoulder or arm while others would attempt to move the doctor's hands to remove the laryngoscope or place the bagger on the patient. No participants were aggressive when making contact, and only did so when the sats were very low,

the doctor ignored questions or suggestions, and after the doctor rejected a challenge with the responsibility phrase.

No common or standard phrase was used by participants, however, all PD phrases included some aspect of the definition of PD as operationalized in the methods. One participant used an advocacy-inquiry approach:

[participant gets to the doctors level and speaks in an even tone] "I know you've tried to intubate twice but what have you done differently the second or the third time?"

Participant #61285 ACP Student

Some participants used the doctor's responsibility phrase to engage PD:

"I would prefer that we pre-oxygenate sir [Doctor: responsibility phrase] we're all responsible for the patient's condition."

Participant #47471 ACP Student

"Ok doctor I think it is best for the patient that we bag the patient up before we try the next attempt [participant picks up bagger, Doctor: responsibility phrase] ok but it's my responsibility for the patient as well"

Participant #11411 RT Student

Examples of PD statements:

"Sir, Dr. Anderson, uh uh, just for the patient's safety I think we'll have to stop you here"

Participant #63060 RT Student

"I'm going to start bagging ok" [moves in past the doctor to bag]

Participant #10372 RT Student

"Ok doctor I think we'll have to call someone else to help"

Participant #36873 RT Student

5) ACP and RT Differences

There were general differences in behaviour between the ACP and RT students. ACP students tended to be much more direct and assertive than the RT students while RT students appeared to have a greater desire to avoid conflict. The preponderance of participants that engaged in physical action were ACP students. The tone of ACP students generally, though not exclusively, was much blunter than RT students.

When ACP students entered the simulation, they tended to go directly to the bedside and be in close proximity to the doctor. RT students tended to stand back from the bed, some at a substantial distance, and wait for direction from the doctor, not moving closer until the patient's sats had dropped. Besides physical positioning RT, students were generally more hesitant and less confident:

[Family member to participant: Do you know what you're doing?] "umm the doctor does"

Participant #80031 RT Student.

6) Physical Behaviour & Reactions

When a participant's suggestions or questions were rejected or ignored by the doctor, or their challenges were dismissed, many participants displayed physical frustration or agitation. Physical displays included hesitant moves toward the doctor or the patient before backing off, shifting their weight from foot to foot or forward and backward, grimacing or displaying a puzzled or confused look, and taking deep inhalations with forceful exhalations. The frustration

or exasperation was also often apparent in participants voices, including when answering questions from the family member.

When the simulation ended, many participants laughed in a relieved manner, made a joke to the doctor, or displayed awkwardness about what to do until the facilitator told them they could leave the simulation room. At the end of the simulation, a few participants made statements such as, “That is tough, very hard!” or “Oh that was it” having realized it was necessary to directly challenge the doctor to end the simulation.

Discussion

The results of the experimental simulation indicate that cognitive load, is a factor in PD, however, the direction of the influence was counter to the expected outcome. RT students in the LCL scenario were less likely to engage in PD. Program was an important variable for PD. Respiratory Therapy students in the LCL condition engaged in PD at a lower rate than ACP students in the LCL condition and all participants in the HCL condition. The Writing Task did not demonstrate any influence on the rates of PD. Several variables were identified as predictors of PD including ethnicity and confidence in airway management. The observational data supported the findings in the primary and secondary analysis as well as provided insights to PD and potential future questions for research.

Primary Analysis

Positive Deviance and obedience were demonstrated by ACP and RT students with differences between the groups, particularly in the frequency of PD. ACP students tended to be older than RT students and had previous clinical experience as Primary Care Paramedics. RT students had more simulation training and more hours of experience with airway management;

however, the “real-world” experience and maturity of the ACP students, including interpersonal experience, is likely an important factor in the differences between programs. ACP students may have previously encountered a situation where a patient was at risk due to a colleague’s behaviour, leading to more confidence in acting. Though both groups were comparable in confidence in airway management, general self-confidence and task related self-efficacy (Daly Guris et al., 2019; Roussin et al., 2018) may be more important for PD than confidence in a specific task.

Sex was not a predictor of PD though it is possible the disparity in sex distribution between programs may account for some differences in rates of PD. Males tend to be more aggressive and assertive and have less emotional valence for negative interpersonal interactions (Del Giudice, 2009; Fino et al., 2019), while females are more concerned with inclusion and cohesive group functioning (Lönnqvist et al., 2014).

Different aspects of the professions may appeal to personality differences that exist between people who choose to enter a certain profession, such as Social Dominance Orientation (Tesi et al., 2020) or Agency and Communion (Weiss, et al., 2014), and subsequently influence behaviour in compliance situations. For example, a person higher in Communion may be drawn to a profession that more highly values teamwork while a person higher in Agency may be drawn to a profession that values independence and autonomy. Some differences between ACP and RT students have been identified, such as RT students ranking higher on the individualizing Moral Foundations of Harm/Care, Fairness/Proportionality, and the binding foundation of In Group Loyalty (Violato, 2020). Further research is required to disentangle effects of profession and personality.

Cognitive load influenced PD; however, the results were counter to expectations that HCL would produce lower PD. Positive deviance occurred at a lower rate in the LCL condition for RT students, but not the ACP students. Though unexpected, when considered alongside the differences in approach and behaviour of the RT and ACP students, the result is interpretable. Generally, RT students appeared to have a greater desire to avoid conflict and were not as direct in their approach to the doctor as the ACP students. The RT students took more time before engaging with the doctor and were more distant physically. In the HCL scenario, the distressed family member appeared to bring the students attention to the rapid desaturation that was occurring and the urgency of the situation. Conversely, in the LCL scenario RT students appeared to take longer to notice the sats and realize the danger the patient was in. Without the urgency created by the distressed family member, participants may have been less likely to engage in PD with the desire to avoid conflict being stronger than the concern for the patient's condition, leading to greater obedience.

For some participants there may be an effect of the Yerkes-Dodson law (Yerkes & Dodson, 1908) on PD. A certain level of arousal, whether physiological, cognitive, or emotional may be necessary to induce people to speak up. Determining differences in arousal thresholds for PD could be valuable in predicting, and explaining why, certain people did not engage in PD in the LCL condition or at what degree of patient danger a person will speak up.

The three-way interaction of Cognitive Load x Program x Positive Deviance was non-significant; however, the z score was comparable to the effect of Cognitive Load and Program separately and the p value neared .05. Higher order effects generally require a larger sample size for detection (Hong, 2020), a three-way interaction may have become significant with a slightly larger sample.

The Writing Task did not influence the rate of PD. Although the method was not successful in the present study, the strong existing evidence for the underlying cognitive mechanisms (Blanton & Christie, 2003; Cialdini, 2006; Holmes, et al., 2014; Wojcieszak, 2011) indicate that the approach still holds promise. The cause for the lack of success of the writing task is uncertain, but a brief writing task alone may not be strong enough to elicit the change in self-concept necessary to alter behavior. Further, as the true purpose of the task was not made apparent to students, it may have lacked the necessary salience to be impactful. It is possible that a more involved activity such as a research report or presentation on compliance in healthcare that is integrated in a curriculum component related to speaking up and challenging authority may be more effectual.

Secondary Analysis

Several individual characteristics had some predictive value for the likelihood of engaging in PD. Despite suboptimal performance of the model selected (the classification accuracy was only 10% better than baseline accuracy and the Kappa values were low), the purpose was not to perfectly predict who would engage in PD. Rather, several variables were identified for further investigation.

Three of the MFQ subscales were predictive of PD. Most notably, In Group Loyalty (IGL) was a negative predictor of PD. Participants high in IGL may more strongly identify with the team and would perceive speaking up as being disloyal to the group. Using the same sample, Violato (2020) showed cultural/ethnic background was a predictor of IGL. Possible cultural/ethnic behavioural differences may be manifested, in part, because of MF. Interestingly, Respect for Authority (RFA) had no predictive value. Overall, the sample scored low on RFA (Graham et al., 2008), which generally is not a very strong Western cultural value (Haidt, 2012).

Ethnicity appears to play some role in obedience aligning with predictions of MF and cross-cultural theories (Graham et al., 2018). If the study were conducted with a sample from a different cultural context, RFA may appear as a negative predictor of PD. Future research, with a larger sample size, including more professions and focused sampling to include proportional levels of various cultural/ethnic backgrounds could provide further insight to the influence of MF. Due to the small sample size the results related to ethnicity should be interpreted as inferences, and direct conclusions should not be drawn.

Confidence in airway management was found to be a negative predictor of PD. Participants that score themselves higher in airway management confidence may be overconfident, and those less confident will have heightened attentiveness to the urgency of the situation because they believe they are less capable of managing the situation themselves, or are more attune to the danger, a possible Dunning-Kruger effect (those lower in ability tend to be over-confident in their abilities) (Dunning, 2011).

Due to the non-uniform use of the responsibility phrase, it was not possible to determine the specific extent of the effect of Displacement of Responsibility. Still, it does appear Displacement of Responsibility was influential in inhibiting PD. All participants that did not engage in PD heard the phrase and the observational analysis showed the use of the phrase was highly influential with some participants. The present findings along with previous findings (Bould et al., 2015; Friedman et al., 2015; Violato, King, & Bulut, 2020) indicate Displacement of Responsibility is an important variable for future study.

Observations

The observational data informed the interpretation of the results of the primary and secondary research questions and led to further insights. In meta-analyses by Griesdale et al

(2012) and Su et al (2011) the time for intubation with experts using a direct laryngoscope in a normal airway ranged from 13-66.7 and 17-93 seconds, respectively. In the present study, the length of time to PD on average was 77 seconds, falling within the range identified by Su et al (2011). When considering the numerous intubation attempts, de-saturation of the patient, and the dismissiveness of the doctor towards the participant, those that engage in PD, at the sample level, appear to have done so within a reasonable time frame. However, the distributions indicate a large amount of variability in individual performance with four different behaviour types: Direct-action, Delayed action/Realization, Inaction, and Frustrated Inaction. Interestingly, it was mentioned to students in the pre-brief before entering the scenario that they were needed “right away” and the situation was urgent. Despite the urgency of the situation there may have been uncertainty as to how to proceed, what amount of help or involvement should be offered, or a degree of fear about doing something. It is also possible that the nature of simulation reduced the perceived urgency.

One of the most interesting aspects of the observational analysis was the physical agitation displayed by many participants, both RT and ACP students. Physical agitation has been previously observed in compliance studies (Asch, 1951; Milgram, 1974) as an outward expression of the difficulty of breaking with the powerful implicit cognitive structures and social norms that create obedience and conformity. The physical agitation of participants is a visible example of the incredibly strong inherent forces of compliance. Reaching the point of physical demonstrations of frustration show how it is easy to ask questions or make suggestions but moving from “I think we should bag the patient” to “Do you mind taking that laryngoscope out of that patient please” can be extremely difficult. The effect was further emphasized by participants laughing or other expressions of relief after the scenario.

Limitations

There were four primary limitations to the study. 1) The ability and confidence of the SPs playing the physicians. The SP's were challenged to make the procedure appear realistic in the first simulations. The actors were also inconsistent with the responsibility phrase and occasionally delivered it at the wrong time or multiple times. As noted by the facilitators the actors tended to act dismissively towards the participants rather than authoritatively or aggressively. The actors had been instructed to act in an authoritative manner, and given examples; however, the novelty of the role and performing the laryngoscopy may have diminished this. Future studies should provide more training to the actors or use health professionals unknown to students and experienced in the procedure being used.

2) Discrepancies in the perceived authenticity of the simulation. Aspects of the study that appeared to be inauthentic to students, such as the doctors lack of urgency (Violato, Witschen, et al., 2020) was not echoed by the facilitators. Facilitators thought the doctor could have been more aggressive, forceful, and emotionally intense to increase the discomfort and challenge of the scenario. The facilitators wondered if the low aggression made it easier for the students to challenge when they otherwise would not have. That said, facilitators noted that what students saw as lack of urgency may have been interpreted by a more experienced practitioner as extreme calmness from an experienced anesthesiologist. One student mentioned that the doctor appeared somewhat "disheveled" in their appearance, and this seemed inauthentic; however, a facilitator noted that it was not uncommon to encounter doctors with a "disheveled" appearance during an airway emergency.

Interestingly, the quality of the SPs reinforces the strength of the influence of authority and hierarchies. Despite SP's struggles, there were participants who did not engage in PD even

when the procedure was being performed very incorrectly (e.g. participants #88821 and #100001). The doctor, though generally appearing incompetent, still affected the participants ability to speak up. A final limitation with authenticity was that CL was not directly measured and a quantitative difference between conditions cannot be determined; as a result, it cannot be conclusively stated the family member condition provided authentically HCL.

3) Being a simulation possibly diminished how seriously participants took the situation. Despite the simulation setting, it appeared participants took the scenario seriously, no participants acted aloof or did not engage with the situation. Additionally, the aural and visual frustration and agitation demonstrated by participants and relieved laughing and statements after the simulation indicates that the scenario was sufficiently engaging and difficult, evoking a psychological and emotional response.

4) The timing of the study and delivery of the writing task. In the weeks prior to the writing task students had received education on speaking up. The potential effect of the writing task may have been washed out by this prior education. Had the writing task been delivered and the study conducted prior to instruction on speaking up the writing task may have influenced behaviour. Conversely, the limitation timing of the study was also a strength. Students had received training on speaking up only a couple of weeks prior to the simulation, yet 36% did not engage in PD. As one facilitator noted, "*We just went over this stuff two weeks ago. They should have all spoken up*". The power of a situation can strongly influence individuals (Lankford, 2009; Zimbardo, 2011) even after recent education and training directly related to the situation.

Implications

Education

The identification of four general types of behaviour during the compliance scenario indicates that it is important to consider individual variability when developing interventions for PD or speaking up. It is likely instructors need to be more intentional about teaching strategies to account for underlying individual differences. This could include teaching simple and explicit rule-based strategies for speaking up.

The difficulty students had in speaking up after having received instruction two weeks prior points to a need to move beyond simple didactic training in speaking up to something that can be more influential and longer lasting. This was attempted with the Writing Task in the present study, and although it did not demonstrate an effect, the approach merits further study. Simultaneously, the facilitators thought the simulation was interesting, strongly supplemented prior instruction and was a positive learning experience for the students *“To see the student’s reactions and the positive parts of the experience that they took from it was valuable.” ACP Instructor*. Prior experience with obedience and patient risk is likely important for speaking up. Simulation training specifically designed to address PD and speaking up, such as the scenario in the present study, in conjunction with robust and comprehensive debriefing could be valuable for preparing students to engage in PD in clinical settings.

Ethnic/cultural background is also likely an important variable to understand for compliance and education. Understanding differences related to ethnic/cultural backgrounds is especially important as countries, like Canada, become more diverse (Government of Canada, 2020), the number of different healthcare roles grow (e.g. Health Care Aides and Practical Nurses) (Kilpatrick et al., 2020), and people from diverse backgrounds enter more health professional roles. It may be particularly important for those with prior experience in healthcare in parts of the world where the manner of practice is less patient centered and more authoritarian

or paternalistic (Triscott et al., 2016). Due to cultural differences previously experienced, health professionals may need specific education on the importance and acceptability of PD.

Research

The present study helps to demonstrate the ecological validity and generalizability of using simulated scenarios for testing non-technical skills training. Ecological validity is supported by real world cases, such as that of Elaine Bromiley (Harmer, 2005) where a physician, or physicians, demonstrate fixation or resistance to the exclusion of external inputs or warnings, whether instrumental (blood oxygen saturation) or human (a colleague's statement of concern). Simulation is also an advantageous setting for conducting experiments that would not be possible in a naturalistic setting. The high degree of engagement and elicitation of an emotional reaction from participants indicates that a simulation scenario can provide adequate clinical verisimilitude for testing interpersonal interactions. Experiments are particularly important for the interprofessional field. It is necessary to not simply transpose findings or analogies from other fields (Breitbach et al., 2017) or infer likely effects, but to test hypotheses (Smets, 2018).

Simulation is also advantageous for psychological experiments where concerns are often raised about context and the generalizability and applicability of the results in a "real world" scenario (Durgin et al., 2012). Simulation can help address the critique of the lack of real-world validity or verisimilitude leveled at psychological experiments (Bless & Burger, 2016) and performing high impact experiments is a necessity (Benjamin & Simpson, 2009).

Continued investigation of internal mediating mechanisms and individual differences is necessary. Further research on personality traits will be important for understanding and predicting PD and obedience. Experience, including professional and life experience, and self-

confidence and self-efficacy should also be investigated further. To better understand patient safety in the context of IPECP and the effects of individual differences in experience, education, and training it is necessary to go beyond system approaches. There is a broad spectrum of health professions and levels of training from students to experts, and variable education on speaking up. Expanding research on compliance and PD to all health professions and levels of training will provide greater insight into team functioning and professional and educational differences. Incorporating psychological theory in research will assist in understanding how individuals behave and how teams influence individual behaviour. Taken together, studying the range of health professions, individuals, and group influences, it will be possible to understand not only how IPECP can produce harm but also how to leverage this knowledge to improve patient safety. Deeper understanding and insight to obedience in healthcare can be attained beyond the broad acknowledgment of student-practitioner hierarchies.

Conclusion

The present study addressed important variables of obedience in an interprofessional setting helping to examine the complexity of compliance in healthcare. The physical and social environment are integrated and interact with the individual. Obedience to authority is a very powerful innate heuristic that can influence behaviour in interprofessional teams, including in unexpected ways through variables such as CL, hierarchical structure, Displacement of Responsibility, and individual differences. The present study demonstrated how LCL and Displacement of Responsibility can inhibit PD for some individuals. Several individual characteristics were found that are likely important for PD and obedience requiring further investigation. Evidence for the ecological validity of using simulation for studying compliance scenarios was also developed. It is important to continue to expand research and understanding

around these variables to make informed changes to the individual and the social environment to reduce pressures that produce compliance, attempt to increase PD, and ultimately reduce harm to patients.

Acknowledgments: The authors would like to thank the Advanced Care Paramedic Program and the Respiratory Therapy program at NAIT.

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CHAPTER V: ANALYSIS OF STUDENTS EXPERIENCE DURING A SIMULATED COMPLIANCE SCENARIO: BEHAVIOUR, COGNITION, AND EMOTION

Chapter Summary: Debriefing interviews were conducted with participants to further understand the events of the simulated scenario in Chapter IV. The results supported the experimental findings and observations of the simulated scenario, while providing insight that participant reports are not always an accurate depiction of what is occurring behaviourally or cognitively.

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Introduction

The present paper describes the second part of a multi-method study investigating obedience behaviour in a simulated airway management scenario. The first part of the study was an experiment conducted to examine if conditions of high and low cognitive load and an educational intervention influence rates of Positive Deviance (PD) through speaking up; the results of which are previously published (Violato et al., 2020). A similar bipartite approach to analyzing a multi-method simulation study was taken by Bould et al (2015).

All healthcare team members play an important role in ensuring patient safety; however it can be very difficult, particularly for students, to engage in PD by speaking up to an authority, therefore studying the influence of group dynamics on PD is critical (Holmes, et al., 2014; Morrow et al., 2016; Peadon et al., 2020). Growing attention is being paid to the group dynamics of healthcare teams, including interprofessionally, and how interpersonal, intrapersonal, and social influences can influence PD by speaking up when something is happening that is inaccurate or unsafe (Holmes et al., 2014; Kaba, et al., 2016; Peadon, et al., 2020). In social psychology the influences of authority and difficulty in challenging authority are understood as aspects of obedience to authority (Cassell, 2005).

Compliance, specifically obedience to authority, is socially and psychologically complex and must be understood as multivariate phenomena (Cialdini & Goldstein, 2004). The nature of human cognition, and the ecological rationality of obedience combined with strong social pressures can make obedience to authority a difficult behaviour to alter, and PD a difficult behaviour to consistently enact. The primary challenge is that humans have limited metacognitive awareness (Friedrich, 1993) and are satisficers, searching to produce desirable outcomes rather than accurate ones (Nickerson, 2007; Simon, 1955, 1956). The limited ability to engage in analytical evaluation of complex situations where there are numerous environmental, social, and psychological inputs, even when analytical thinking is preferable, means humans rely on heuristic strategies that are generally functional or ecologically rational behaviour, such as obedience (Kahneman, 2011, Marsh et al., 2004; Todd & Gigerenzer, 2012).

The complexity of obedience to authority, and human's tendency towards intuitive rather than reflective thinking means that to improve our understanding of obedience in the health context and begin to improve PD, it is necessary to begin to systematically investigate relevant

variables. Multivariate problems require sophisticated understanding and to only use socially constructed power-dynamics as the explanatory modality, as is common (Morrow et al., 2016; Peadon et al., 2020), without understanding the personal, cognitive, social, and environmental forces behind obedience limits interpretability.

Recently a survey was conducted to better understand the function of obedience across a broad range of health professional students. The survey results indicated that impression management (IM), moral distress (MD), and Displacement of Responsibility (DOR) are important influences on individuals' engagement in compliance behaviour (Violato, King, & Bulut, 2020). Further research identified that health professional students exhibit self-enhancement through motivated reasoning by believing themselves to be less susceptible to compliance pressures than peers (Violato, King, & Bulut, 2021). Currently lacking is a detailed examination of these psychological phenomena during a specific compliance scenario.

Impression management is the way in which people try and influence or control other's perceptions of them through self-presentation, with self-presentation being related to a person's self-concept. Impression management can vary based on context, motivation, and social situation and role expectations. Concerns with self-presentation can lead to obedience through a focus on alignment with another person's perceptions or expectations, especially from an authority (Collins & Ma, 2000). In healthcare, interprofessional interactions have been found to be contexts of impression management (Lewin & Reeves, 2011)

Moral distress is the psychological distress that arises from being unable to act in a way that a person believes or knows is morally correct due to external factors (Fourie, 2015). When a person experiences moral distress it can lead to negative outcomes including disengagement and

burnout (Monrouxe et al., 2017), outcomes that can potentially increase the likelihood of obedience (Bandura, 1999).

Displacement of responsibility is the abdication of a sense of responsibility, moral or otherwise through engaging in plausible deniability through placing the responsibility on another source (Bandura, 1999). Displacement of Responsibility has been shown to be one of the most important factors for obedience to authority (Davis et al., 2006; Milgram, 1965; Richardot, 2014).

The purpose of this study was to explore participants reasoning for their behaviour, and effects of IM, MD, and DOR during the Violato et al (2020) experiment. A multi-method approach will be used, gathering quantitative and qualitative data, to address five research questions:

1. What reasoning will participants express for engaging or not engaging in Positive Deviance?
2. Will participants experience a need for Impression Management, and does it influence their behaviour?
3. Will participants experience Moral Distress, and does it influence their behaviour?
4. Will participants engage in Displacement of Responsibility?
5. Can any other insights be obtained about obedience and Positive Deviance?

Methods

Simulation Phase

The simulation-based study consisted of an experimental design examining obedience behaviours in Respiratory Therapy (RT) students, n=40, and Advanced Care Paramedic (ACP) students, n=19. The experiment was a 2x2 design, participants were randomly assigned to conditions of High and Low Cognitive Load (HCL, LCL) and an Interventional Writing Task

and Neutral Writing Task. The simulation consisted of an airway management scenario with a standardized patient as a doctor (confederate) on a third intubation attempt having difficulty securing the airway. Deliberate deception was used by not telling the participant the purpose of the simulation. The participant entered the scenario and the patient's blood oxygen saturation (sats) and heart rate would drop as the doctor continued to attempt to intubate without making any changes. The main outcome measure was if participants would engage in PD by speaking up and making a strong challenge to the doctor to prevent harm to the patient (see supplemental materials for simulation design). The doctor was instructed that if the students made two challenges they were to indicate "*it is my responsibility for what happens here*". While all doctors used the phrase, it was applied inconsistently.

Twenty-one participants did not successfully engage in PD. There was a significant effect where RT students in the LCL condition engaged in PD at a lower rate than students in the other conditions. The writing task did not demonstrate an influence on behaviour. Participants that did not engage in PD would frequently ask questions, make suggestions, and read the sats, however, they would not engage in a direct challenge. For a full description of methods and results see Chapter IV.

Debriefing

Immediately following the simulation scenario participants were debriefed by the facilitator observing the simulation. The facilitator was an instructor experienced in simulation-based education and training, airway management, patient-advocacy, and PD. During the debrief, participants were asked questions to understand the psychological experience of the simulation, rather than focusing on the task or skill. The debriefing questions aligned with the reaction and analysis stages of the 3-Phase debriefing structure (Sawyer et al., 2016). The main questions

focused on student's explanations of behaviour and expectations about peer behaviour, IM, MD, DOR. Facilitators were provided with a full written script outlining the purpose, instructions, and questions for the debriefing. All facilitators were instructed to read the script verbatim to the students (for the full debriefing protocol see Appendix E). The debriefing was audio and video recorded. A standard debriefing, aligning with the summary stage of 3-Phase debriefing, was conducted the next day with participants during class time, focusing on methods for engaging in PD and how to act in a similar scenario. Ethical approval was granted by the University of Alberta Research Ethics Board 2 (Pro00089450) and the Northern Alberta Institute of Technology Research Ethics Office (#2018-15). Participant consent was obtained throughout the study, including after the debriefing, where consent to have all data included in the study, including audio and video recording, was reaffirmed. All participants consented at all stages.

Analysis

A multi-method approach was taken to data analysis. Videos were watched and transcribed verbatim for analysis (EV and EV). Responses to yes or no questions, for example: Do you think your peers would have acted in the same way that you did, were counted as frequencies. Frequencies of answers to direct yes or no questions were recorded. Responses to categorical questions between RT and ACP students were compared using chi-square analysis.

For non-direct questions, a qualitative descriptive approach was taken (Sandelowski, 2000). Debriefing videos were transcribed, videos and transcriptions were reviewed to develop familiarization with the data. Data was then organized in a descriptive summary of the informational content identified in participant responses. The summaries and content were organized based on the template of the interview, primarily Reasoning, IM, MD, and DOR, other content that emerged was summarized under the category of Other Observations. The qualitative

descriptive approach is low inference, focusing on descriptive validity, an accurate accounting of events, and interpretive validity, an accurate accounting of the meaning participants assigned to events. The qualitative descriptive approach is not highly interpretive in the sense of choosing a conceptual, philosophical, or other abstract framework but in the effort to understand the latent, as well as manifest, content does have an interpretive element (Sandelowski, 2000). To remain closer to the data the interpretive aspect took a critical realist perspective. The critical realist perspective aligns with a qualitative descriptive approach, the data provides information about the structure of the event or phenomena though what is occurring at the observable level may not directly reflect what is occurring at an unobservable, deeper level (Willig, 2020). The quantitative analysis, qualitative analysis, and the results from Chapter IV were incorporated across the different levels of summary to varying degrees based on the informational content provided in participant responses.

Results

There were a total of 54 videos, five of the RT student videos were lost due to technical difficulties. During the debriefing, some facilitators missed questions, so not every student was asked every question. The question most frequently missed was regarding family members perceptions for those in the HCL condition (See Table 1). Some participants provided rich responses while others were briefer, however, all participants appeared engaged, gave thorough consideration to their answers, and appeared to answer the questions honestly (see Table 2 for supporting quotations related to the different constructs).

Table 1. Response Frequencies to Closed Ended Debriefing Items for Advanced Care Paramedic and Respiratory Therapy Students

Item	Responses in the Affirmative			N
	ACP	RT	Total	
Would Peers Behave the Same	17	29	46	49
Concerned with Drs Perceptions	9	26	35	49
Concerned with Family Members Perceptions*	1	8	9	15
Concerned with Facilitator Perceptions	9	16	25	53
Concerned with Self Perception	4	20	24	43
Feelings of Distress	14	27	41	53
Feelings of Personal Conflict	13	27	40	52
Feelings of Moral Duty	18	34	52	54
Who Bears Responsibility?‡	Would not bear	3	8	11
	Did not think about	5	11	16
	Shared/Full	11	16	27

* $p < .05$

‡ Open ended item, responses were coded based on participants responses

Table 2. Supporting Participant Quotations

Theme	Sub-theme	Quote
		<i>“What led me to speak up was he already did two intubations and he didn’t seem open to other things, I noticed respiration was at 0 but when sats dropped I thought this is going way too deep.”</i>
Reasoning		<i>Participant #47471 ACP Student</i>
	Peer Behaviour	<i>“I think there will be people who will speak up more or do more than I did, I think there will also be some people too scared to speak up.”</i>
		<i>Participant #20141 RT Student</i>
Impression Management	Doctors Perceptions	<i>“Initially he might take a dislike to me but after the fact may gain respect for me being able to challenge up and draw the line. Subconsciously we all think about what other people think about us, so yah I think there is a tendency to make ourselves look better or make the other person perceive us in a better light”</i>
		<i>Participant #98793 RT Student</i>
		<i>“Just given being new am I overstepping? He’s older, clearly he’s been a doctor for a while, is it my place to say something?”</i>

Participant #10269 RT Student

“Being in the hospital, being an EMS there’s an unspoken groundwork where the doctor has his area and we don’t really challenge his area, then there’s our area, like the ambulance bay where they don’t really challenge us”

Participant #47471 ACP Student

“That one I had a lot more [concern with perceptions]. Her [the family member] concern for the patient was running through my mind a lot more and what she may think of me later, it was more personal concern than professional concern”

Family Member
Perceptions

Participant #40375 RT Student

“I had a little bit of a panic moment, like I should be suggesting ways to make this easier when he said he couldn’t visualize the airway, that’s when there was a prompt of instructors thoughts”

Facilitator
Perceptions

Participant #43854 ACP Student

“This probably isn’t going so hot, but I don’t know what to do”

Participant #91928 RT Student

Self Perception *“That was my first time getting into that kind of situation, so I wasn’t even sure how I was going to act in that situation so it’s a good way to learn more about myself”*

Participant #29609 RT Student

“The doctor didn’t seem like they knew what they were doing. I was trying to figure something out but couldn’t figure out what else to do. This is a situation I haven’t been in before and I don’t know how to put the patient’s best interests first.”

Participant #99462 RT Student

Moral Distress Feelings of Distress and Personal Conflict *“I was trying to think of a way to phrase it that we could stop and reassess the situation, but I didn’t want to say you failed three times because that’s a bit abrupt”*

Participant #67046 RT Student

“I didn’t know how to make myself known, make my thoughts heard or make him aware... I thought it would be better to shut up”

		<i>Participant #93004 ACP Student</i>
	Moral Duty	<p><i>"I think the golden rule should apply to anybody, if I was on the table, I wouldn't want my sats to get below what that persons were"</i></p> <p style="text-align: right;"><i>Participant #97964 ACP Student</i></p>
		<p><i>"I didn't feel any responsibility because the doctor said its on him"</i></p> <p style="text-align: right;"><i>Participant #78486 RT Student</i></p>
Displacement of Responsibility		<p><i>"I'm going to be there but I'm going to document what I did and what I said but its on him, that's on him, if that patient dies that's on that gentleman right there not on me"</i></p> <p><i>"I'm comfortable with what I did, I made an attempt and can defend myself. I did everything I could without getting fired"</i></p> <p style="text-align: right;"><i>Participant #67046 RT Student</i></p>
Other Observations	Misperceptions	<p><i>[Facilitator: "I would have grabbed the bagger and reinforced that its time to stop] "Oh ok, I didn't realize you can actually say stop. I didn't think about bagging right away, I just wanted him to stop and switch up."</i></p>

Participant #67046 RT Student

“I was relieved after I voiced my concerns, after I said stop [participant did not say stop], at that point I think if anything went wrong it would be on the doctor not me”

Participant #22809 RT Student

“There’s that butt pucker when you see the sats drop to 60s”

Participant #90984 ACP Student

Veracity &

“It felt quite real, the actors made it realistic”

Verisimilitude

Participant #99462 RT Student

“That was just nerve racking”

Participant #60189 RT Student

“I feel more confident that I didn’t freak out or just blank. It’s made me more confident”

Student

Participant #50882 RT Student

Experience

“I learned a lot, thanks for this, it was so fun I love it. I was so nervous before, right now I feel so good”

Participant #87208 RT Student

"That was cool though, I learned a lot about myself. A lot about myself"

Participant #98793 RT Student

Reasoning

All participants viewed themselves as having challenged the doctor and engaged in PD to some extent. When asked why they had or had not spoken up all participants indicated the primary reason for speaking up, or wanting to speak up, was a concern for the patient's safety and well-being because the patient's sats were dropping, the situation was becoming unsafe, and the doctor did not appear to be following proper procedures or changing his approach. Several participants mentioned the doctor appeared to be struggling and was getting "frazzled", "agitated" or was "shaky". A few RT students mentioned that the presence of the family member spurred them to speak up.

Peer Behaviour

Forty-six participants (ACPs = 17, RT = 29) thought peers would act the same as themselves with no significant difference between ACP and RT students, [$\chi^2 (1, N = 49) = .016 p = .9, V = .02$]. ACP and RT students expected most peers would behave similarly to themselves, though both groups acknowledged a potential range of peer behaviour. Participants' expectation of others acting differently was that some peers would be more timid or would not do anything and "freeze up". Several participants mentioned *hoping* peers would act like themselves more

than *thinking* peers would act like themselves. Participants had an expectation of a certain standard of care that would lead to peers speaking up.

Only two ACP students thought peers would have acted more assertively or aggressively than they did, while approximately a quarter of the RT students believed peers would have acted more assertively or aggressively than they did, or would have done more.

Impression Management

Professional Perceptions

The majority of participants, (n = 35, ACPs = 9, RT = 26), were concerned with how the doctor might perceive them, with no significant difference between ACP and RT students, [χ^2 (1, N= 53) = 3.13, p = .08, V = .24]. Concern with perceptions was primarily focused on how the doctor may perceive them professionally and were focused on being a good or agreeable team member. A common phrase from many students was “*I don't want to step on toes*”. Participants frequently discussed interprofessional collaborative practice and frustration the doctor did not seem to view them as a team member or respect them. Participants nearly uniformly indicated no concern with how they were viewed personally, however, some participants identified that personal perceptions are always a concern in interpersonal interactions.

One aspect of professional perceptions that consistently arose was the doctor's authority. Participants saw the doctor and his authority as being legitimate and based in knowledge and experience, making it difficult for them to speak up. Participants expressed concern with how an expert might perceive a neophyte, such as themselves, engaging in a challenge. These concerns were more strongly expressed by RT students. ACP students acknowledged the doctor's authority, though generally did not see authority as influencing their behaviour.

Concurrently, participants also recognized that a hierarchical order naturally arises between a learner lacking in training and experience and a doctor with experience, knowledge, and a leadership role. The hierarchy tended to be addressed as a matter of fact, being based in competence and training and not as an arbitrary ordering. Though hierarchical structure was acknowledged as a potential barrier to PD it was not always viewed as impeding PD.

Family Member Perceptions

Only participants in the HCL condition were asked about family member perceptions. Nine participants (ACPs = 1, RT = 8) were concerned with how the family member might perceive them, with a significant difference between ACP and RT students, [$\chi^2 (1, N = 15) = 5.00, p = .03; n=15, V = .6$]. The RT students indicated a high level of concern with the family members trust in them and did not want the family member to think that they did not care about the patient. Participants not concerned with the family member indicated it was necessary to block out the family member to deal with the situation.

Facilitator Perceptions and Influence on Behaviour

Twenty-five participants (ACPs = 9, RT = 16) were concerned by how the facilitator might perceive them, with no significant difference between ACP and RT students, [$\chi^2 (1, N = 53) = .09, p = .77, V = .04$]. Participants only indicated a concern with professional and not personal perceptions. Participants unconcerned with facilitator perceptions indicated it was something they did not even think about or consider as they were completely in the moment and forgot the facilitator was there. Generally, participants who expressed concern with the facilitators' perceptions were unsuccessful in challenging the doctor.

Most students, forty-one, indicated they were concerned with being perceived as competent (ACPs = 14, RT = 27) with no significant difference between ACP and RT students, $\chi^2 (1, N = 46) = .07, p = .79, V = .04$. Some participants thought facilitator perceptions influenced their actions as it caused them to focus on wanting to perform well and be successful to demonstrate competence. Many students indicated competency and demonstrating an appropriate skill level was always a concern.

Self-Perception

Twenty-four participants (ACPs = 4, RT = 20) indicated they were concerned with their own self-perception during the simulation, with no significant difference between ACP and RT students, $[\chi^2 (1, N = 43) = 3.41, p = .07, V = .3]$. Participants' concerns with self-perception were primarily related to if they were doing a good job. Several students mentioned self-perception was related to "self-growth" and the simulation forced them to reflect on compliance scenarios and engaging in PD. Participants not concerned with self-perception indicated it was not something they had considered or that they were only concerned with doing their job.

Moral Distress

Feelings of Distress and Personal Conflict

Forty-one participants (ACPs = 14, RT = 27) indicated experiencing some MD during the simulation, with no significant difference between ACP and RT students, $[\chi^2 (1, N = 53) = .002, p = .96, V = .01]$. Moral distress typically occurred when the sats were dropping and the participant was questioning or making suggestions and the doctor was not responding. Participants' MD was focused on the patient's well-being and inability to alter the situation. Most participants indicated a moderate level of distress. Several participants spontaneously

generated a ranking of distress ranging from 4-7/10, with 10 being maximum distress. Feelings accompanying distress were generally frustration, anxiety, and nervousness, with some participants feeling anger. Several participants indicated feeling awkward, as though they were not supposed to be there.

Forty participants (ACPs = 13, RT = 27) indicated they felt some form of personal conflict during the simulation, with no significant difference between ACP and RT students, [χ^2 (1, N = 52) = .002, $p = .96$, $V = .001$]. When the doctor was not receptive to participants questions, suggestions, or challenges a range of internal dialogues were commonly expressed by both ACP and RT students about what to do next. Many participants contemplated why the doctor was struggling and how long it would take for him to succeed: *"I'm sure this guy has done this thousands of times he's just having a real bad day"* Participant #63060 ACP Student. The participants were uncertain about the extent to which they should respect the doctor's knowledge and experience, leading to nervousness about speaking up and stepping in. Participants were also unsure about the appropriate level of intervention to express concern without being disrespectful or impolite. Participants did not want to "step on toes" or "push boundaries". Some participants thought of escalating physically and taking over. Others felt a sense of resignation that there was nothing more they could do, while others thought it was best to keep doing the same thing.

Moral Duty

All but two participants, fifty-two (ACPs = 18, RT = 34), indicated they had a sense of moral duty to the patient during the simulation, there was no significant difference between ACP and RT students, [χ^2 (1, N = 54) = .2, $p = .66$, $V = .06$]. The two participants who did not report a sense of moral duty to the patient indicated it was because it was simulation. When asked about a

sense of moral duty most participants responded in a strong affirmative “100% Yes”. Participants had a sense of moral duty while knowing it was a simulation “*I treat the sims like real life*”, “*That mannequin could be a real person in the future*”. Several participants indicated perspective taking gave them a sense of moral duty by thinking about themselves in the patient’s situation. Some participants also felt a sense of moral duty to the family member.

Displacement of Responsibility

Eleven participants indicated they did not think they would bear any responsibility for the outcome (ACPs = 3, RT = 8), sixteen participants indicated they did not at all think about who would bear responsibility (ACPs = 5, RT = 11), twenty-seven participants indicated there was shared or full responsibility (ACPs = 11, RT = 16). There were no significant differences between ACP and RT students, [χ^2 (2, N = 54) = .77, p = .68, V = .12]. There were no significant differences in rates of positive deviance between the three groups (no responsibility, did not think, shared/full responsibility) [χ^2 (2, N = 54) = 3.79, p = .15, V = .26], and no significant differences when ‘no responsibility’ and ‘didn’t think’ were combined and compared with shared/full responsibility [χ^2 (1, N = 54) = 2.15, p = .14, V = .19].

Participants that indicated not thinking about who would bear responsibility stated it was because they were focused on the patient or the task at hand. Those that identified having shared or full responsibility most often did so because of a sense of moral responsibility or concern with thoughts and feelings about themselves if the patient were to die. Some participants mentioned a sense of responsibility to the family member, as well as the patient. Participants often acknowledge that though they knew they were not legally responsible or culpable there was still a sense of responsibility. Some participants identifying shared responsibility were concerned about possible formal consequences. See Table 3 for participant insights on responsibility.

Participants who did not believe they bore responsibility indicated it was because they were a student and if anything went wrong it was the doctor who would be held responsible. These participants focused on application of blame rather than moral or ethical concerns with several indicating they had done everything possible, and their actions exculpated them from responsibility. These participants often made statements regarding responsibility prior to being asked the interview question regarding responsibility. Participants also mentioned when the doctor made the responsibility statement, they no longer felt responsible. The five participants that made the strongest statements about not being responsible were all male RTs and did not engage in PD.

Table 3. Insights on Responsibility

"I wasn't sure if it would be my actions that would lead to the patient being in danger. I felt it was my moral ground to, how do I put this, I felt like I had to do what was best for the patient and the onus was on me to call out the doctor or anyone else if I see them doing that kind of thing in the future."

Participant #80493 RT Student

"There was a thought in my mind, its like because I didn't act aggressively enough to help this patient would I then be seen at fault as well? A blind man is still at fault, 'what else could I have done' is pretty plaguing"

Participant #49374 ACP Student

"I did think back to an incident where nurses failed to inform the doc of de-satting patient, so I had in the back of my mind everyone is responsible for patient care"

Participant #32591 ACP Student

“I morally felt like I needed to do something, not for license, if that patient crashed and I felt like I could have done something it would have haunted me”

Participant #99462 RT Student

“That definitely crossed my mind, this is his patient, he’s the higher level of care, then it came into my mind that even though I’m not legally responsible for this patient that the moral responsibility came in more.”

Participant #43854 ACP Student

Other Observations

Misperceptions

Many participants misperceived their actions during the simulation in two ways. One group believed they had made a strong challenge to the doctor, acting confidently and assertively. In actuality, these participants acted less confidently than they believed, and challenges consisted of only questions, suggestions, or reading the sats. Participants thought repeating these actions several times or stating them with more urgency was a strong challenge. Some participants believed they had exhausted all means of speaking up and thought there was nothing more they could do, while others wanted to do more but were uncertain how to do so. During the debriefing, some of these participants engaged in discussion with the facilitator that led them to realize they could have taken more action.

The second group believed they could have done better or done more when they had in fact made a strong challenge. These participants felt they had not been assertive or confident enough and that there must have been more they could have done. Students who performed particularly poorly, or very well, did have accurate perceptions and awareness about their performance.

Students also misremembered their actions during the simulation. Three participants remembered themselves as having told the doctor to “Stop” when they had not done so, and one recalled themselves stating they were going to call for assistance when they did not do so. Interestingly two of these participants were also participants that believed they did not bear responsibility for what happened because they had sufficiently challenged the doctor.

Physical Contact

Participants varied in the extent to which they considered a possible challenge through physical contact. Physical contact ranged from placing a hand on the doctor’s shoulder while saying it was time to stop, to trying to push the bagger over the patient’s mouth, to attempting to remove the laryngoscope and stylet. No participants used aggressive physical contact, though eleven used some degree of physical contact to stop the doctor. Physical contact was most often made by ACP students (7), during the debrief none of the ACP students considered physical contact extraordinary. Two of the RT students that used physical contact worried about having been too aggressive while the other two thought physical contact was necessary. Many RT students thought about using physical contact though considered it completely verboten. When RT students asked the facilitator if anyone had used physical contact and the facilitator replied in the affirmative the students were shocked and incredulous. It was difficult to contemplate escalating to physical contact.

Veracity & Verisimilitude

During the debriefing several of the RT students asked the facilitators if this kind of situation occurred in practice or how often it occurred. Some participants asked the question with a sense of incredulity, not believing the simulation could be realistic. When facilitators answered that similar situations did in fact frequently occur, participants were surprised and wanted to know how to act in those scenarios. No ACP students asked this question.

Despite acknowledging the doctor's lack of skill or technical ability, the simulation created a degree of clinical verisimilitude that felt real to students, evoked a stress response, and created immersion and naturalistic behaviour. Many participants identified the doctor as having a kind of "fixation" or "tunnel vision", facilitators affirmed to participants that this was a real effect. Some participants thought the situation could have been more stressful.

Unique Cases

Although there were many unique and interesting cases and insights, four stood out and are described below.

One student was an International Medical Graduate and had previously been a physician in Iran. After unsuccessfully pursuing licensure in Canada, he was training as a RT to remain in healthcare. This participant mentioned cultural difficulties in being able to speak up: *"You might think I should be more assertive but I couldn't do that because not knowing your culture very well, how to be more assertive without offending someone"* Participant #48456 RT Student. The participant also mentioned that in Iran there is no means to challenge the physician, they are considered the absolute authority and are not questioned.

Another participant indicated that German, rather than English, was their first language. The participant spoke English fluently with no trace of an accent though mentioned: *“The thing I found hard is, I get very nervous in situations like these and since English isn’t my first language my brain just completely shuts down and I don’t know what to say. So I found that interesting, how I was trying to say stuff but I couldn’t.”* Participant #26740 RT Student. The participant went on to recall a guest lecturer telling them that when you believe someone is doing something wrong there is a certain set of words you can say and they must stop and someone else has to step in, she tried to remember but couldn’t recall the words, or sequence of words. Interestingly, the participant successfully engaged in PD, being very direct with the doctor.

Two participants mentioned that despite being aware of what was happening during the simulation, with one having anticipated the scenario to a degree, the participants found they could not challenge the doctor and were confused by the fact that they couldn’t act.

“The patient was de-satting and the heart rate was getting low, I don’t know, but he was very persistent in trying to get it in, I didn’t know how to react at that point, and it didn’t look too good [participant referring to their behaviour]”

“Ok maybe I’ll just wait for a little bit lower of a sat and then he’ll think no we should start bagging and he didn’t and I was like confused”

“A lot of my friends wouldn’t know how to be assertive and they would just freeze up like I did”

Participant #91928 RT Student

“Honestly, before hand I was thinking about possible scenarios this could be in my own head, and I was like maybe this could be like they want us to challenge, I already had this in my head but I still wasn’t aggressive, which was really strange. I think to me that I kind of anticipate but I

still didn't do anything, but I knew you guys were watching so I need to keep pushing even just a little bit. That was the hard part, I kind of know what I should be doing."

Participant #59106 RT Student

One participant had interesting insights into the effect of authority, hierarchy, and responsibility:

"[How would peers act?] I'm certain some would be more forceful but at the same time this is a simulation when this happens in real life I don't think you're going to be that forceful, I'll be honest with you, I can see, I can see you're supposed to be more forceful but in real life the doctor has the say and they're going to go with the guy with 30 years experience verse a punk who just got on the floor last year."

Participant 67046 RT Student

Student Experience

All participants were checked for discomfort or distress related to any aspect of the study during debriefing. No participants indicated any negative outcomes or feelings. Most participants stated that participation in the study had been a positive experience, was stimulating, beneficial for learning, prepared them for the future, improved confidence, and had been fun.

Almost every participant indicated they thought they could have done more, wished they had acted sooner, had not been concerned about what the doctor might think, and desired more knowledge and experience to deal with situations of compliance. When expressing a desire to have been better able to engage in PD, students also often asked what else they could do, what other tools for speaking up were available to them, and how the facilitator would have acted. As a learning experience it seemed there was a stronger effect for RT students than ACP students, though ACP students also found the simulation beneficial.

Discussion

Participants' responses during the semi-structured interview indicated that during the simulation, participants had IM concerns with differences between ACP and RT students. Participants also expressed MD and DOR was influential for some participants, with fewer differences between ACP and RT students. Other observations indicated that perception and memory may be inconsistent with reality and that simulations such as the one conducted can have a positive impact on students.

Reasoning

Identification of the decreasing sats indicates participants were well versed in the technical nature of intubation and physiological response and were aware the situation was becoming unsafe. The concern created by the presence of the family member that led to more forceful action supports the main findings from Violato et al. (2020) where RT students in the low cognitive load (LCL) scenario engaged in PD at the lowest rate. The distressed family member seemed to heighten the emotional valence of the condition, increasing the participants need to speak up. ACP students were generally unaffected by the family member. Differences also appeared between RTs and ACPs for expectations of peer behaviour. Both groups used themselves as a reference point with a much larger proportion of RT students believing that peers would have been more aggressive or assertive than themselves. These results support likely individual and professional differences between RT and ACP students.

Impression Management

The effect of authority enacted through IM was observed in students' concern with being perceived by the doctor as a good, competent member of the interprofessional team. This

influence is possibly best exemplified by the frequent use of the phrase “*not wanting to step on toes*”. The phrase identifies the authority of the doctor and the different roles each team member plays. Participants consistently and spontaneously identified the legitimacy of the doctor’s authority and their lower position in the hierarchy of the healthcare team. The doctor’s authority and hierarchical position was based on differences in knowledge, experience, and professional roles and was seen to be legitimate rather than an artificial social construction of power.

Legitimate authority is of particular import in the context of healthcare because authority that is legitimate is a soft influence that occurs through credibility and is much more difficult to challenge than the harsh influence of illegitimate authority that occurs through external means (Cialdini & Goldstein, 2004; Koslowsky et al., 2001). Participants identified the existence of boundaries based on having less knowledge and experience, being in the doctor’s space, and wanting the doctor to see them as being a good, competent team member able to fulfill their professional role. As a result, participants did not want to be seen as not knowing their professional role and overstepping boundaries and causing problems. Interestingly for both groups, participants’ concern with being polite almost seemed disproportionate to the extent to which the patient’s safety was at risk. These concerns with perception relate to the effect of social influence enacted through the need to fulfill the goal of accurate behaviour (Cialdini & Goldstein, 2004). Obedience in hierarchies is often construed as blind adherence (Srivastava, 2013; Wang et al., 2018); however, as demonstrated in this study and in others, obedience is not blind (Bègue et al., 2015; Bouchard, 2009; Frimer et al., 2014; Richardot, 2014). The situation can have an extremely powerful effect, such as for the students that were aware of what was happening but were unable to act.

While both groups identified the presence of hierarchy and authority and did not want to overstep boundaries, there appeared to be less influence on ACP students. No significant difference was identified between the ACPs and RTs on concern for the doctor's perceptions, however, the χ^2 test neared significance with a moderate effect size. The differential behaviour and concern for doctor's perceptions indicate RT and ACP students view authority and hierarchy in the healthcare team differently. The lower regard for other's perceptions is also seen in ACPs lack of concern for family members perceptions when compared with RT students. These results reflect how differences in dispositions to cohesive group functioning can affect speaking up (Tesi et al., 2020; Weiss et al., 2014). Training and education along with individual differences may influence speaking up. Further research should attempt to differentiate behavioural difference that arise because of personality types that may be attracted to different professions and how training and education create differences between professions.

The strength of influence related to obedience to authority is seen in the RT students' concern for the family members as a reason for speaking up. The high level of the family members distress and emotional concern for the patient's was necessary to move the student beyond the influence of authority and engage in PD. When considered with the results of Violato et al (2020), fewer RT students would have been emboldened to move across the hierarchy and challenge the authority if the family member were not present.

Participants often struggled with what was indicated by self-perception, and when answering took a reflective approach focused on professional performance and growth. The near significant difference, with a moderate effect size, between RT and ACP students indicates RT students may be more concerned with self-perception. RT students may give greater consideration to their actions while ACP students may be less reflective and more reactive to

situations, doing what is necessary in the moment for patient care with less concern for what is exactly right or wrong, or for other's perceptions. For ACPs this could be a strength when considering some of the situations they work in can be volatile and dynamic. ACPs also function more independently and may themselves be at the top of a hierarchy, depending on the context of care. Possible differences in reflective tendencies related to the different natures of the professions including contexts of practice, anticipation of challenging scenarios and opportunities for reflection could help explain why RT students engaged in PD at a lower rate than ACP students (Mann et al., 2007).

Moral Distress

The observed effects related to MD were consistent with the literature (Morley et al., 2019). Moral Distress was evoked through wanting to do the right thing while being unable to change the situation in the face of an unresponsive doctor. Feelings associated with MD occurred including frustration, anxiety, and anger. Resignation or disengagement were also observed when participants essentially gave up on trying to change the doctor's actions or felt all they could do was repeat questions, suggestions, and read the sats.

Participants' discussions of the initial approach to the doctor and subsequent reactions reflect the cyclical approach to navigating hierarchies identified by Vanstone & Grierson (Vanstone & Grierson, 2019). The cyclical approach involves *Appraisal, Selecting a Strategy, Enacting the Strategy, and Refining and Adapting*. Vanstone's cycle was applied at a macro-level, however, as a model it appears to apply to specific interactions as well. In the present study students appraised the situation identifying the doctor's expertise and authority and then chose and engaged in a strategy to attempt to challenge the doctor. When participants were stymied and the Refining and Adapting phase was unsuccessful, feelings of MD developed, as Vanstone

(2019) identified. Issues of legitimate authority arose again as participants recognized the doctor's expertise and did not want to appear disrespectful, RT students more so than ACP students, making it difficult for them to enact a strategy which in conjunction with the doctor's dismissiveness creates distress. Physical action was a strategy considered, though for many participants, did not seem available. In the RT program, the students are taught physical contact is completely unacceptable unless they are "*1000% sure it is necessary*". The desire to escalate to physical action as a refinement or adaptation while not being able to do so seemed to contribute to the student's resignation and distress. Further research would be necessary to determine what situational, individual, or professional differences can lead to escalating to physical action.

Participants strong sense of moral duty to the patient indicate participants were treating the situation seriously and had been imbued with a strong sense that it was necessary to treat simulations seriously and as real life. Students' mindset towards simulation training helps to explain the moral distress that was experienced. If students were less engaged and took the simulation less seriously moral distress may not have occurred. It is unknown if less engaged students may differ in PD in clinical practice, future research should examine the possibility.

Displacement of Responsibility

Contrary to expectations DOR did not appear consistently at the sample level but was a strong influence for some individuals, either because of the doctor's responsibility phrase or their professional position. Participants that made the strongest statements about not bearing any responsibility appeared to be engaging in motivated reasoning through plausible deniability. Motivated reasoning is the cognitive mechanics used to arrive at a desired conclusion generally framed as 'can I believe it?' and 'must I believe it' (Epley & Gilovich, 2016). When asking

“Must I believe I am responsible?” It was possible to answer: “No, because my professional position in the hierarchy of the team means the doctor is responsible” or “No, the doctor said it is his responsibility”. These results reflect the findings of Bould et al. (2015) and others (Bandura, 1999) that indicate DOR is a powerful factor for obedience.

Displacement of Responsibility not appearing as consistently as expected is also important. It is possible DOR may function differently in healthcare professionals than in other populations, possibly related to a greater concern with Harm and Care (Leffel et al., 2017). If this is the case it could be more difficult to identify when and for who DOR will be influential as it might not function consistently or when expected. Interestingly, three of the participants that made the strongest statements about DOR scored above the sample mean in Respect for Authority, indicating the possibility a measure of respect for authority or authoritarianism may be predictive of DOR. Certain individuals may have cognitive frameworks when they enter healthcare, or the frameworks are later developed, that can make them predisposed to obedience through DOR. When the five students that made the strongest responsibility statements are compared with the group mean on the Moral Foundation of Respect for Authority (mean = 17.3), three of the five scored above (18, 20, 21), one scored equivalently (17), and one below (16) (see Violato et al., 2020).

Other Observations

Misperception/Memory

All participants viewed themselves as having challenged the doctor, though there was a wide range of behaviour. Participant’s misperceptions of acting better or worse than they did seemed to stem from a lack of knowledge and experience regarding making a challenge and PD. During the debriefing, when the facilitator informed the participant that they had either done well

or that they could have changed tactics or escalated, participants often had a moment of realization. Many participants, primarily RTs, had not known they could have changed tactics, escalated their concern through communication tools such as CUS (Concerned, Uncomfortable, Safety Issue) or Advocacy Inquiry methods, told the doctor to stop, or called for help. For many participants, the simulation served as a learning experience and the misperceptions were due to a lack of reference knowledge about what constituted a strong challenge and good performance.

Most interesting were participants that misremembered telling the doctor to stop or calling for help. Human memory, while mostly reliable for general events, is fallible; especially in complex or ambiguous situations, people may reconstruct the actions of others and themselves (Brewin et al., 2020). While possible participants had a lapse in memory, it is also likely participants were again engaged in motivated reasoning. For participants who indicated they said “stop” it is likely a case of ‘can I believe it’. These participants were able to engage in the necessary reasoning that led them to believe they said stop and that by having done so, were exculpated from responsibility. Interestingly, Beran et al (2013) observed a similar effect in a study of conformity where participants denied inserting a needle in the wrong place during arthrocentesis on a knee. Participants motivated reasoning in the present study likely arose out of the desire to not be considered responsible, in the Beran et al (2013) study motivated reasoning may have arisen due to the desire to be seen as competent.

Misperceptions and misremembering have implications for self-evaluation and expected behaviour. There is an abundance of research that people perform poorly across many metrics when it comes to accurate self-evaluation and expected behaviour (Zell et al., 2019). The present findings demonstrate, to an extent, inaccuracy in self-perception. Without practice and

experience it is unlikely students will develop an accurate perception of their knowledge and skills for engaging in PD and if they will engage in PD when a situation calls for it.

Cultural Diversity

Two cases arose in the present analysis that provided insight to the concurrent challenge of cultural differences and language for engaging in PD. The participant that is an International Medical Graduate noted the uncertainty that cultural and professional differences create in being able to speak up, while the participant with English as a second language identified the challenge posed by being a non-native speaker.

With increasing immigration to Canada (Government of Canada, 2020) and the need to train new healthcare professionals with diverse backgrounds and incorporate previously trained healthcare professionals, a more specific focus on PD may be necessary for these individuals. More specialized training might include a focus on general differences in culture as well as in healthcare, i.e., patient centered vs paternalistic, and what is considered appropriate in Canadian, or North American, practice.

Non-native English speakers may pose a greater challenge than cultural differences. Even if a person is prepared to speak up and engage in PD in a culturally appropriate way, the stress of the situation may be an impediment to finding the proper words. Challenges posed by language, even for native English speakers, supports developing a consistent, simple, and explicit means for speaking up. If a person finds they are struggling with language, having a simple standard method for challenging may make it easier to find the necessary words. The non-native English participant mentioned a lecture about “words to use” but struggled to remember the words. Training that is sensitive to language difficulties may be beneficial for an ESL professional to make tools for speaking up, such as CUS, more salient and easier to recall.

Not all people coming from different cultures and countries will experience these challenges, however, the general need and benefit of education on compliance and PD combined with the broad diversity of cultural backgrounds in North America would make specific or specialized training beneficial for new immigrants entering healthcare.

All participants thought they engaged in PD and had done so because the patients' sats were dropping, though behaviour was often misperceived or misremembered. Participants had several IM concerns centered around being perceived as competent that enhanced or inhibited speaking up. The simulation caused moral concerns to arise that spurred people to speak up. Some participants readily engaged in DOR that led them to cease trying to challenge the doctor. Multiple other insights were gained including for perception and memory, and cultural and language impacts. From the cumulative results, several educational implications can be derived.

Implications for Education

In addition to investigating the research questions the simulation appeared to have positive learning outcomes for the participants related to PD and speaking up. The results of the debriefing interviews provided several emergent insights and implications for education on PD and speaking up. Insights and implications include Using Simulation for Experience, Simple Tools, Tactics for Training, and the Influence of Profession.

Simulation for Experience

Several participants were surprised that situations such as the one modeled in the simulation happen in real life and were unclear about what a strong challenge constituted. It is necessary to provide participants with unambiguous, possibly extreme, examples of compliance situations and PD to illustrate what ideal PD looks like. Ideally this would be done by practicing simulated compliance scenarios. As demonstrated in the present study, a compliance simulation

with a debriefing related to the participants behaviour, thoughts, and moral implications provides the opportunity for questions, feedback, discussion, and instruction. Simulation focused specifically on compliance scenarios could be incorporated with didactic instruction on interprofessional education, speaking up and challenging authority, and psychology. Videos for educational sensitization and scaffolding could be incorporated prior to simulation. Using videos demonstrating a person at a professionally equivalent level would provide a mental picture of what PD looks like and how to effectively escalate actions when being ignored.

Using simulation to teach about compliance can create a desire for more education on the topic of compliance and PD from students. Compliance simulation scenarios can likely bolster student's confidence in themselves, giving them experience and self knowledge about how they may behave in similar situations in the future. For participants less successful in their performance no apparent damage to self-efficacy or confidence was apparent but rather a desire to improve was initiated. Participants in the present study expressed that the confidence from having been in a compliance scenario before entering practice was beneficial by providing knowledge about how they will act and what tools to use. Video review could be simply and effectively incorporated. Using a similar approach, Hémon et al (2020) used simulation to teach about compliance, effectively generating conversation during debriefing to teach about teamwork. Students have less authentic practice experience to provide the opportunity for reflection and the associated deeper learning (Mann, et al., 2007); simulations would provide the opportunity for reflective practice for compliance and speaking up.

The effectiveness of a compliance simulation would likely vary depending on the profession and experience. In the present study, the simulation appeared to be a more effective learning experience for the RT students than ACP students, likely owing to ACPs prior

experience. Early exposure would likely make simulations for compliance and PD the most impactful, coupled with follow up measures to determine efficacy. If a person is unaware what a situation of negative compliance may be like it is not reasonable to expect engagement in PD. Some participants demonstrated an awareness or expectation that PD will be even more difficult in clinical practice. It is better to learn in simulation what would constitute PD than having to experience and learn about it in clinical practice. As with technical skills and knowledge, students should learn and practice engaging in PD.

The simulated scenario was evocative and believable for participants. With support from educators and a proper debriefing, scenarios such as the present one are psychologically safe (Friedman et al., 2015). Based on participants and facilitator feedback, the scenario could have been even more stressful and challenging, such as having a doctor that was aggressive rather than dismissive.

Simple Tools

Relatedly, what constitutes speaking up, challenging, or PD needs to be made explicit and consistent. Students tend to use inefficient strategies for speaking up such as naïve questions (Hémon et al., 2020). Presently there are multiple tools proposed that can be used for speaking up (O'Donovan & McAuliffe, 2020; Okuyama et al., 2014). Selecting one method, taught consistently across professions as a common tool will create familiar language to all members of interprofessional and uni-professional teams. The tools selected should allow for escalating concern with a clear point where a person can explicitly say “stop”. A potential method is CUS – concerned, uncomfortable, safety (Gerstle, 2018). If a person has asked questions and made suggestions that are not well received or ignored, then they could use CUS. In the present study participants expressed that when their questions and suggestions were ignored, they felt distress,

discomfort, frustration, and anxiety. These feelings are encompassed by Concerned and Uncomfortable and could possibly make CUS more salient to people in a stressful situation. Additionally, CUS is clearer than a two-challenge rule or an advocacy inquiry approach, both of which include a greater degree of ambiguity and interpretation around what constitutes a challenge. Incorporating the cyclical strategy identified by Vanstone (2019) may also be effective as a simple structure to embed a strategy like CUS to aid students in making a challenge: *Appraisal* (should I speak up), *Selecting a Strategy* (use CUS), *Enacting the Strategy* (state I am Concerned), and *Refining and Adapting* (state I am Uncomfortable). Future research should examine the efficacy of the different tools in different contexts using more objective methods such as experiments (O'Donovan & McAuliffe, 2020).

Tactics for Training

Moral Ethical Implications Simulation can extend beyond teaching technical, interprofessional, and interpersonal skills to engage students in moral and ethical scenarios, such as with do not resuscitate and end of life scenarios (Smith et al., 2018; Tanoubi et al., 2020). This approach can be used as a teaching moment to engage in discussions regarding moral and ethical concerns. Focusing on the moral and ethical implications of student behaviour in a simulation related to PD and speaking up in compliance scenarios can support targeted education on moral responsibility and ethical behaviour.

Competency Framing The concern with competency identified in the present study and others (Okuyama et al., 2014) may indicate another practical means for increasing the rate of PD. Engaging in PD could be framed as a competency and skill, just as intubation is a skill, that must be learned, practiced, and done, when appropriate, to be a successful healthcare professional (Violato & King, 2020). If PD is a required competency rather than something exceptional,

people may feel more confident and comfortable in engaging in PD and do so at a higher rate. Emphasizing competency could move people beyond the social influence of legitimate authority to the view that legitimacy does not always equate with being correct and that it can a demonstration of competency to “step on toes” when necessary.

Perspective Taking Using perspective taking is a possible means for creating individual change to promote PD. Several participants reported considering themselves in the patient’s situation gave them a sense of moral duty. Other participants were concerned with how they would feel if a real person died and they had not acted, expressing that they would be “plagued” or “haunted” by the result, i.e. a second victim syndrome (Quillivan et al., 2016). Reflective activities focused on being in the patient’s position and the potential distress associated with negative outcomes could potentially increase perspective taking and help people to engage in PD when they otherwise might not.

Leverage Responsibility The effect of Displacement of Responsibility could be leveraged as a potential means for improving the rate of PD for people that may be low in their sense of responsibility or obligation to patient safety. Speaking up could be framed in a context where speaking up is an exonerating behaviour. For example, by engaging in PD through making a full and strong challenge such as “you need to stop right now the patient is at risk”, culpability can be removed.

Influences of Profession

Several differences and similarities between ACP and RT student’s behaviour, cognition, and emotion were noted. Differences were related to experience and personality while similarities were observed in competency concerns and a sense of moral duty to help the patient. The observations and responses to the debriefings from this current study aligned with the results

from Violato et al (2020). Understanding differences and similarities across all healthcare professions is necessary for education and practice. Specialized education on compliance and PD that targets professional idiosyncrasies may be necessary. Conversely once professional differences are understood, whether broad or small, it may be more effective to use a standardized approach across all professions.

The present study demonstrates early evidence of pedagogically efficacy, thus in-depth education on compliance along with continued and focused research is necessary for using simulation to teach and practice PD. For any interventions implemented to improve PD in a compliance scenario it is necessary to examine behaviour longitudinally (O'Donovan & McAuliffe, 2020).

Limitations

There were two primary limitations of the study. 1) It was a simulation study. Although many students stated they treat simulation as if it is a real environment, it is possible that participants experience and subsequent perceptions around IM, MD, and DOR may change if experiencing a similar situation in practice. Future work should attempt to study these constructs in 'real life' situations. Comparing results from clinical practice with simulation studies can lead to the improvement of simulation scenarios and the development of concurrent and predictive validity evidence. 2) Not all participants were asked all questions and facilitators didn't always ask probing or follow up questions to brief responses. Though it does not appear that there would be an influence on the overall conclusions drawn, it is possible that valuable insight or contrary opinions may have been missed.

Conclusion

The present research has begun to examine and test theories related to obedience producing new insights into the phenomena, including for education. These insights include concerns with impression management, moral distress, Displacement of Responsibility, legitimate authority, individual and professional differences, motivated reasoning, self-evaluation, and education. It is necessary to move beyond the social constructionist, post-modernist, power dynamic interpretations that are prevalent for understanding PD and speaking up (Morrow et al., 2016; Peadon et al., 2020) and understand the psychology at work. A great deal of further research across the broad spectrum of healthcare professionals is necessary to better understand negative compliance and PD and improve patient safety.

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CHAPTER VI: DISCUSSION

The results of the research comprising this dissertation are an initial step towards a more refined understanding of obedience to authority in healthcare including the innateness (meaning organized ahead of experience) (Marcus, 2004), of obedience as a heuristic and social force that can produce patient harm (Smith & Hatemi, 2021). In Chapter II, obedience is described as an innate social and cognitive mechanism to solve adaptive problems that affect all humans. There are different approaches to understanding obedience and to promoting PD, with variable efficacy and theoretical value. It was argued the most promising approaches would incorporate psychological theory, in particular theories drawn from the broad fields of social, cognitive and moral psychology. The incorporation of the psychological theories of Bounded Rationality (Simon, 1955), Social Influence (Loh & Ren), and Moral Foundations (Haidt, 2001) was attempted throughout the dissertation. Numerous factors that can facilitate obedience and a potential new education method were laid out and tested with implications for team functioning and patient safety. The research aimed to:

1. Improve knowledge about obedience to authority and hierarchies and promote research that is grounded in psychological theory which generally has not been integrated into healthcare research.
2. Investigate factors, environmental and individual, that may facilitate or mitigate obedience to better understand how the factors function in healthcare contexts. Under *what* social, environmental, and individual conditions are people likely to be obedient or positively deviant?
3. Develop an intervention that might be effective and efficient and can fit within the existing health professional curriculum to promote positive deviance.

Research Questions

To what extent, in what ways, and why, do health professional students demonstrate obedience to authority?

Based on the model presented in Chapter II and the results described in Chapter III, students are influenced by several social and psychological factors and disclosed that they frequently demonstrate obedience to authority during their education. Further, Respiratory Therapy (RT) and ACP students both demonstrated obedience to authority in a simulated compliance scenario (Chapter IV). Based on responses to the questions asked during debriefing, participants disclosed that Impression Management, Displacement of Responsibility, and Moral Distress were all active during the compliance scenario and appeared to influence PD. The Moral Foundation expected to be most influential, Respect for Authority, did not have the expected association, though In-Group Loyalty was important. The writing task, the intervention delivered pre-simulation, had no impact, contrary to the hypothesis outlined in Chapter II. Cognitive load had a counter-intuitive influence, where RT students in the LCL condition demonstrated less PD, and potentially, cognitive load may not always function as expected influencing other aspects of obedience. Individual factors, such as ethnicity and experience, were also important variables influencing PD. Southeast Asian and Middle Eastern ethnicity were negative predictors of PD, while the clinical experience of ACP students positively influenced PD. Results of the debriefing interviews provided insight into the difference in RT and ACP behaviour. Interviews revealed that prior clinical experience made ACP students quicker to engage with and challenge the doctors, while for some RT students, the family member in the HCL condition prompted them to action rather than serve as a distraction. The interviews also helped to explain how Impression

Management was active and can influence behaviour in a compliance scenario. Participants were concerned with being viewed as competent and good team members and did not want to “step on toes” causing them to hesitate. While it was a simulated scenario, participants experienced Moral Distress resulting from feelings of responsibility and concern for the patient’s outcome.

Displacement of Responsibility was revealed to be influential for some participants where the doctors use of the responsibility phrase led them to step back and feel a diminished sense of responsibility. It was also apparent from the results presented in Chapter V that people’s perceptions regarding obedience and how they behaved are not always accurate, and may be misperceived or misremembered. Some participants misperceived the strength of the challenge they made, recalling a weak challenge, such as asking questions, to be a strong one. Other participants remembered making a challenge when they had not.

Primary Research Question One

What are the rates of negative compliance for health professional students during their education and how are these related to Impression Management, Displacement of Responsibility, and Moral Distress?

In Chapter II, a computational model of the obedience to authority heuristic was proposed where Moral Foundations Theory and Social Influence function under the constraints of Bounded Rationality to create a disposition to obedience that is also influenced by social, environmental, and personal factors. The survey results in Chapter III explored the model proposed in Chapter II by measuring the influence of Impression Management, Moral Distress, Displacement of Responsibility reported by health professional students on obedience and conformity. The relationship between experience and demographic characteristics in health professional students was also explored. These factors were incorporated with frequencies of

negative compliance events and student reported experiences. Impression Management serves as a framework for analyzing the social environment and how other people influence self-presentation and compliance and was measured through the survey items and one open-ended item. Impression Management was valuable in understanding if the goals of Effective Action, Building and Maintaining Social Relationships, and Self-Concept Management, as aspects of Social Influence identified in Chapter II, were present. Participants were concerned with fulfilling goals of accurate behaviour, building, and maintaining social relationships, and self-concept maintenance. For example, 60% of participants indicated a high level of concern with being viewed as a “typical member” of their profession. Eighty-nine percent altered their behaviour and 67% altered their thinking to align with the behaviour and thinking of those around them. Displacement of Responsibility, one of the most important factors for obedience, was also used to analyze the environment. The high frequency (66%) with which participants engaged in Displacement of Responsibility, helped establish that students have experiences with people evoking the requisite authority to elicit motivated reasoning and Displacement of Responsibility. Students encountered situations with high enough emotional valence and moral implications to elicit Moral Distress with 51% reporting being highly distressed and 13% being extremely distressed. Finally, in Chapter III, the environment of application was analyzed by gathering student perceptions of compliance and how perceptions mapped onto the computational model of the obedience heuristic. The *Desire for Smooth Interactions* and *Student-Instructor Dynamic* match with Impression Management and the strength of influence elicited by those with authority. Students reported going along with what an instructor says for the purposes of assessment and adapting behaviour when there is a “power differential” with an instructor and it is not ‘worth it’ to question the instructor’s actions. Participants identified

Experience and Knowledge as Supportive Factors and a Need for Education on Positive Deviance. Confidence and comfort to speak up and ask questions gained through experience and more preparation to engage instructor and manage conflict were viewed as supporting challenging authority. These findings align with the expectation outlined in Chapter II (see Chapter II Table 1) that experience and knowledge would support challenging authority.

Primary Research Question Two

Can a simple educational material reduce the rate at which participants demonstrate Obedience to Authority, conversely will the educational material aid engagement in positive deviance?

The writing task, as implemented in the studies described in Chapters IV and V, did not have the expected effect. Writing about the negative outcomes of not speaking up and how one would engage in speaking up did not create self-concept change to increase the rate of PD. Self-concept change can occur through the consistency principle most effectively when the action taken is active, effortful, and internally motivated. The writing task may not have met these conditions. Three possible explanations for the lack of an effect include: 1) the single writing task may not have been effortful enough to elicit self-concept change. 2) the delivery and purpose of the task may have needed to be made explicit for students to actively engage with the purpose of the writing task as opposed to it being just a piece of a study. Being a piece of a study may also not have created any internal motivation when completing the writing task. and 3) the writing task was delivered after students had already received instruction on speaking up, and the prior education may have superseded the writing task's effects. Possible modifications and improvements are further discussed in Chapter VII in the Implications and Future Directions section.

Primary Research Question Three

Will high cognitive load increase the rate at which students demonstrate Obedience to Authority, conversely will high cognitive load inhibit positive deviance?

The effect of cognitive load had an unanticipated effect on PD within the clinical simulation and what was expected to be extrinsic cognitive load, noise, may have been intrinsic cognitive load, information relevant or important to the task. Respiratory Therapy students in the low cognitive load scenario demonstrated significantly lower rates of PD than students in the other conditions. It was expected that the presence of a distressed family member would inhibit the rate at which people spoke up. It was thought that participants would be distracted by the extrinsic cognitive load generated by the distressed family member. Understanding what sources will constitute intrinsic or extrinsic cognitive load and how the type of cognitive load will facilitate obedience is necessary. Instead of being a factor for extrinsic cognitive load, the family member's concern helped the participant speak up by increasing attentiveness to the patient's condition and enhancing concern for the patient's well-being. Increased attentiveness was seen in the observational analysis in Chapter IV when the family members concern drew the student's attention to the blood oxygen saturations. Increased attention and concern for the patient's well-being was also discussed during the debriefings reported in Chapter V when students stated the family member drew their attention to the situation and made the students more concerned for the patient. Some participants were also concerned with the family member's perceptions.

In the present study, cognitive load may have been related to, or be better explained potentially by, two other factors, 1) Arousal and 2) Realism. 1) A certain level of arousal, whether physiological, cognitive, or emotional, may be necessary to induce some individuals to speak up. Some of the variance in PD might be explained by the Yerkes-Dodson law, where performance on a specific task is related to arousal levels and optimal performance occurs within

a certain threshold of arousal, outside of which performance decreases (Yerkes & Dodson, 1908). Predicting who has a high arousal threshold for PD could be valuable in predicting and explaining why certain people did not engage in PD in the LCL condition. A better understanding of cognitive load and arousal in these contexts could be particularly relevant for human factors research and designing environments that promote PD. 2) It is possible that the increased urgency or attentiveness created in the HCL condition is more related to realism of the scenario, where the HCL condition more closely mimicked the stress of a real-world scenario, than effects of cognitive load. Participants in the LCL condition may not have perceived the urgency of the situation to the same extent as in the HCL condition where the family members distress made the seriousness of the patient's condition, and the doctors struggles more salient.

Secondary Research Question One

To what extent will Displacement of Responsibility facilitate Obedience to Authority?

The study reported in Chapter III identified that students in compliance scenarios commonly engaged in Displacement of Responsibility. The results from the study reported in Chapter IV are less conclusive due to the inconsistent use of the SP's responsibility phrase. Though it is not possible to state with precision the influence of Displacement of Responsibility, as enacted through the SP's responsibility phrase, the results align with prior research from Bould et al (2015) where participants (residents) indicated that responsibility for the events in a simulated OR scenario rested with the senior physician and so they did not feel responsible. Together, these results indicate that Displacement of Responsibility plays a role in obedience in a healthcare context. In the present study, the results of the debriefings reported in Chapter V indicated that Displacement of Responsibility was an important factor for not challenging the doctor for some participants. The participants explicitly identified that the doctor's responsibility

statement and their own thoughts about who would bear responsibility directly influenced their behaviour. More consistent and authoritative use of the responsibility phrase could have produced higher rates of obedience through Displacement of Responsibility.

Secondary Research Question Two

Will Respect for Authority be a predictor of Obedience to Authority?

The Moral Foundation of Respect for Authority did not function as expected. Respect for Authority, as measured by the MFQ, was not selected through Elastic-Net Regression as a predictor of PD, and the sample scored low on the trait. Despite Respect for Authority not being selected as a predictor variable, people were still obedient and other variables from the MFQ were selected as predictors. The Moral Foundation of In-Group Loyalty, as measured on the MFQ, was selected as a predictor for obedience and may have value in explaining obedience in healthcare teams. In-Group Loyalty and concern for being perceived as a good team member may be more important for eliciting obedience. To an extent, the results in Chapter V indirectly support respect for authority. Students identified that the doctor's senior position and implicit competence were important for how students thought about the situation and if they should intervene or not. The sample score on Respect for Authority, which was low, is comparable to the norm for North American populations (Graham, et al., 2008; Graham et al., 2016) and overall is likely not an influential aspect of participants moral matrix. However, Respect for Authority, as measured on the MFQ, may be selected as a predictor for obedience for people from different cultural/ethnic groups, for example South East Asian ethnicity (Chapter IV).

Secondary Research Question Three

What is the influence of experience, confidence, age, and sex on Obedience to Authority?

Of the four variables investigated, only sex was not selected as a predictor. Age and hours of airway management experience were weak negative predictors of PD while confidence in airway management was a relatively stronger negative predictor of PD. The weak effect of age and lack of a sex effect for participants aligns with the preponderance of prior research on obedience (Blass, 1999; Pattni et al., 2017). When these results are considered in conjunction with the difference in rates of PD between ACP and RT students, and the results of Chapter V, general experience, outside of procedural knowledge and confidence, seems to be influential. Respiratory Therapy and ACP students rated themselves as equally experienced and confident in airway management. However, RT students had more hours of airway management experience than ACP students, 70.4 hours for RTs vs. 30.3 hours for ACPs, while ACP students had more prior clinical experience than RT students, 37.6 weeks for ACPs vs. 5.95 weeks for RTs. It appears that more important than procedural experience and knowledge is clinical experience. The greater amount of clinical experience of ACPs supported engaging in PD, while RTs lack of clinical experience appeared to inhibit the ability to engage in PD. In Chapter V, the lack of clinical experience was identified by some students as being influential on their reasoning and behaviour. Several RT students stated that in their position as a student and someone who did not have much experience compared to the physician, they did not think it was their place to speak up or that speaking up would not be well received. These findings align with the results reported in Chapter III, and findings from Sydor et al. (2013), that clinical experience is helpful in speaking up.

Secondary Research Question Four

To what extent will students experience the need for Impression Management in a simulated compliance scenario?

Impression Management related to professional perceptions is important for many students. Students from both professions indicated concern with how the doctor would perceive them professionally, but not personally. It is possible that students were accurately reporting a lack of personal concern and were only concerned with the presentation of the professional self; however, two alternative explanations are viable. Professional and personal perceptions are possibly inextricable, where professional identity is highly integrated in personal identity, and enact the same self-image to the student. Evidence from other health professions has shown a high level of integration of personal and professional identity (Beran, et al., 2012). Alternately, students may not have wanted to acknowledge a concern with how they were perceived personally or were not aware of the extent to which concerns for personal perceptions were influential. Previous research has identified social identification in obedience paradigms where the participant identifies with, and wants to be liked by the authority; however, concerns over social desirability related to appearing as a competent professional lead to a lack of acknowledgement of concerns for personal perceptions (Riecher et al., 2012; Stavrova & Kokkoris, 2019) It would be expected the concerns for personal perception are important as personal acceptance or 'being liked' by peers or others is important for the goal of building and maintaining social relationships and self-concept maintenance (Chapter II). Further investigation would be required to determine the veracity of these explanations.

Secondary Research Question Five

Will the simulated compliance scenario elicit Moral Distress in students?

Feelings of Moral Distress can be elicited through a single compliance scenario. Students indicated the simulation elicited distress and self-generated reports of several emotions and feelings associated with Moral Distress, as reported in the literature. When attempts at speaking

up were not accepted, or the attempts were not successful in changing the doctor's behaviour, students expressed frustration, anger, helplessness, and futility, emotions that have been previously reported in relation to Moral Distress (Lamiani, et al., 2017). The visible physical distress identified in the observational analysis described in Chapter IV supports the debriefing results in Chapter V where students expounded on the distress experienced. The physical distress and agitation displayed is reminiscent of the behaviour of participants in the original Milgram studies (Burak, 2013; Milgram, 1974) Anxiety and concern for the patient's conditions met with an inability to change what is happening can create a sense of futility and negatively influence PD. Although the students experienced Moral Distress during the simulated scenario, based on the setting and context, debriefing, and single instance of the experience, long term effects related to Moral Distress, such as burnout, would not result (Teodorczuk, 2021).

Model of Obedience – Refinement

Together, each study's results provide evidence for the model of obedience presented in Chapter II. The general form of the model stands with room for refinement. Moral Foundations remain relevant, but the foundation of Respect for Authority may not be as important as expected with In-Group Loyalty perhaps being a more important Moral Foundation. Student's professional and competency concerns understood through Impression Management support Social Influence. Students are attempting to fulfill the goals of accurate behaviour and inclusion. While not directly supported, and with some counter evidence from the lack of effect of cognitive load, Bounded Rationality is supported through Moral Foundations Theory, Social Influence, and Displacement of Responsibility. Moral Foundations Theory and Social Influence are present through two primary pieces of evidence. First, the influence of In-Group Loyalty, and second, the presence of the Fixed Action Pattern of compliance with authority, exemplified by

Displacement of Responsibility, and student's impression management concerns with meeting the goals of accurate behaviour and social inclusion. These strains of evidence of pre-conscious cognition support the satisficing nature of human cognition as would be expected under Bounded Rationality. If there were no effects that aligned with evidence or prediction based on Moral Foundations Theory and Social Influence, no evidence in the present research would point to Bounded Rationality as an explanatory and predictive theory of human cognition.

The variables selected through Elastic-Net regression, cultural and language influences, and cognitive load/environmental realism experienced by students during the simulation indicate the importance of the non-discrete categories of Social, Environmental, and Personal variables on obedience. The influence of Social and Personal variables is evidenced through the cultural/ethnic backgrounds that were predictive of lower rates of PD. The effect is exemplified by the participant that discussed the direct inhibitory challenge presented by previous experience as a healthcare worker in a different country, specifically that a doctor would never be challenged. Further, the negative effect a stressful situation and having ESL can have on verbalizing or recalling the tools PD shows the effect of social and personal factors. Conditions external to the participants, specifically the presence or absence of the family member, influencing behaviour exhibits the importance of environmental and social factors where attention is drawn to the patient's condition and concern exists about the family members perceptions.

While a quantifiable strength of influence on obedience for each aspect of the model cannot presently be determined as the sample size is not large enough to develop any sort of structural model, the evidence warrants contingent support for the general structure of the model based on a framework incorporating Bounded Rationality, Moral Foundations Theory, Social

Influence, and Individual, Environmental, and Social factors. Further investigation and refinement of the computational framework of the obedience to authority heuristic is necessary. With consideration of the necessity of large sample sizes, in the future the veracity of the model could be investigated using Structural Equation Modelling (SEM). An emergent set of methods, causal inferential-based methods, could also potentially be used to investigate the structure of the model and the interactions of individuals in social networks. A model based on a set of inferences could be systematically tested (e.g. the effect of In-Group Loyalty vs Respect for Authority vs cultural/ethnic background), that can provide insight to the effect of different aspects of the model. Causal inference-based models allow for the modelling of the free interactions of individuals independent of groups through simulation (computer). Using these methods, it could be possible to not only inferentially test a model of obedience but also the effects of an educational intervention or training. The effect of an intervention to improve PD within a social network could be estimated relative to mediating or moderating factors of the proposed model of obedience. Not only would this provide insight for the inferences being tested but also for the potential system level patient safety impacts of an intervention. Causal inferential-based methods could be used with smaller sample sizes than SEM as there are no distributional assumptions.

General Findings

Theories of Bounded Rationality, Moral Foundations, and Social Influence were drawn upon to create a guiding framework to expand the investigation of the psychological mechanisms of obedience in healthcare. In doing so, the results of the dissertation, beyond the specific research questions, have added more general knowledge to other domains of healthcare related to the investigation of obedience. This includes the further demonstration of the use of simulation

for experimental designs, which concurrently can increase the rigour of IPECP research. The focus on pre-licensure students, in particular those outside of medicine and nursing, expands the field of research to other important members of healthcare teams. While investigating group dynamics efforts were also made towards developing knowledge at the individual level. Finally, these efforts contribute to addressing some of the sources of patient harm.

Psychology & Theory

The four chapters attempt to integrate several theories within a model of Moral Foundations Theory, Social Influence, and Bounded Rationality, viewing obedience as a heuristic (Chapter II). The investigation of each aspect was somewhat cursory due to the choice of broad scope, incorporating several different perspectives. For example, each investigated variable and theory referenced has an extensive body of literature and could comprise its own program of study for understanding compliance; Impression Management alone could generate an abundance of psychological and ethnological research.

The results of the present research have implications for some of the ongoing refinement of the understanding of the construct of obedience to authority (Haslam et al., 2015; Haslam & Reicher, 2012; Reicher et al., 2012). The innate tendency towards group cohesion (Hodges, 2017) may be a more important factor than obedience to authority alone or act as the primary mechanism through which obedience to authority occurs (Frimer et al., 2014). Wiess et al. (2014) and Tesi et al. (2020) show that obedience and support of hierarchies occur through dispositions to group cohesion, and obedience to authority is strongly influenced by in-group loyalty (Frimer et al., 2014). Obedience and respect for authority have also been suggested to occur through Social Identification and engaged followership, the identification with the authority figure by the obedient person (Haslam & Reicher, 2012; Reicher et al., 2012). Humans

are “groupish”, having a tendency towards group membership (Haidt, 2012). In-group preference is a well-established phenomenon strongest amongst groups of attitudinally similar individuals that have chosen group membership (Brewer, 2007). It is unlikely the fundamental mechanism in healthcare teams that leads to obedience to authority is blind adherence (Wang et al., 2018) or submission within a hierarchy. The exertion of power through hierarchical structures is ineffective for group cohesion and for those using power in human and non-human groups (de Waal & Suchak, 2010). Instead obedience more likely occurs through the influence of the disposition to in-group loyalty, social cohesion, and group maintenance supported by legitimate authority. Holmes et al. (2014) discuss the group effect in the context of the Hidden Curriculum and the maintenance of professional cultures dissuading deviant behaviour. Concerns related to hierarchical position, punishment, and ostracism for speaking up are valid; however, to a greater extent, could be socially oriented post-hoc moral justifications to explain compliance (Haidt, 2001). People report hierarchical position, punishment, and ostracism as causal for obedience. However, the actual cause may be related to a disposition to group loyalty that is pre-conscious and cognitively unavailable. A shift away from perspectives that understand the causes of people’s behaviour as being rational could be invaluable for understanding compliance in healthcare.

The results of the present research seem to support the notion of in-group focused obedience to authority. Differences existed between the RT and ACP student’s behaviour and rates of PD (Chapter IV). Concurrently, near significant differences existed in concern for doctors’ perceptions and the desire to appear to be a good or agreeable team member (Chapter V). In-Group Loyalty was selected as a negative predictor for PD (Chapter IV), and RT was related to scoring higher on IGL (Violato, 2020). The context of the professions’ roles also seems

to support the effect of group cohesion. Respiratory Therapists are more likely to practice in a hospital environment where they will more consistently be working with physicians. Advanced Care Paramedics function more in primary care or pre-hospital environments, less in hospital team environments, and are less often found in interprofessional teams. In addition, ACPs may be at the top of some hierarchies. An ACP student identified the environmental separation; in the hospital, the ambulance bay is the ACP's area where doctors do not challenge them (Chapter V).

The importance of IGL, the lack of importance of Respect for Authority, and Impression Management influences, particularly concerns about professional perceptions and competency, indicate the possibility of a new conception of obedience. These outcomes considered in the setting of an interprofessional team with the goal of patient care may indicate how obedience can be variably produced based on context. A tentative bipartite model of obedience to authority comprised of individual-oriented and group-oriented obedience, or Obedience I and Obedience G, respectively, is proposed. A two-factor model of obedience may help to explain the different ways in which obedience occurs.

Obedience I is obedience that occurs through the influence of the authority themselves. In these cases, the obedient person is not concerned with group membership or being perceived as a good team member but is obedient due to the authority's influence. The authority may exert influence through harsh or soft tactics, and the authority may or may not be legitimate. In Obedience I, obedience occurs primarily through the influence of hierarchical position, professional or social status, or personality, though all may act together. In Obedience I those who score high on measures such as ACT or respect for authority are most likely to be obedient. Situations where Obedience I may be prevalent would be during military operations (hierarchical position), listening to a police officer (professional status), buying a product based on a celebrity

endorsement (social status), and joining a cult (personality). Obedience I will most easily be enacted in unclear and ambiguous situations where other people are not present or primarily non-group members are present. Obedience I is what is perceived to occur most often in compliance scenarios in healthcare.

Obedience G occurs through the influence of the authority as a member or leader of a group. A person is not obedient due to the influence of the authority themselves but through the authorities group membership and mechanisms of group loyalty, identification, and engaged followership. The authority will likely be legitimate, and soft or harsh tactics may be used. Obedience to the authority occurs primarily through the desire to demonstrate value as a competent member of the group and an ability to act in a cohesive/aggregable manner that supports group cohesion. In Obedience G, those that would score high on IGL, communion, or demonstrate strong Impression Management concerns, would likely be obedient, along with those scoring high on ACT or respect for authority. Obedience G would be prevalent on a sports team (competent group member) or during cult membership (ability to act cohesively/agreeably to support group cohesion). Obedience G is most likely to be enacted where a group is engaged in a goal-directed action. Obedience G is likely what most often occurs in compliance scenarios in healthcare.

Both Obedience I and G could be influential in the same setting and would not necessarily function exclusively. However, based on environmental and social situations, one will be more prominent and influential. In the Milgram paradigms, it is likely that Obedience I was most active while in the present research or in the Sydor and Bould studies (Bould et al., 2015; Sydor et al., 2013) Obedience G was most active. Obedience I and G demonstrate the principle of equifinality. Due to the human disposition to obedience, both Obedience I and G will

affect all humans, but it can be hypothesized that due to humans' social disposition and groupish nature Obedience G will be stronger and more consistently elicit obedience.

The results also support the psychological principle of equifinality, as discussed in Chapter II. Throughout, multiple factors that can produce obedience were explored. The principle of equifinality does not argue that anything can be a causal mechanism. Rather, it is necessary to incorporate several relevant theoretical perspectives and factors and test them to understand the influence on obedience. In this dissertation, equifinality was seen in how the LCL scenario resulted in obedience, while for some participants, Displacement of Responsibility appeared to be the important factor for not engaging in PD. The same outcome, obedience, occurred through different influences.

A variety of theories were drawn upon and, although it could be argued the diversity of approaches is ultimately not sufficiently reductive, it is necessary to begin from an initially broad approach to develop a more focused and refined investigation. The integration of interdependent facts is necessary to represent the total situation (Lewin, 1939). Additionally, the theories and perspectives drawn upon constitute a small sample of potential approaches to investigation. For example, Social Cognitive Theory (SCT), with a long history of research and a wide body of evidence (Lo Schiavo et al., 2019; Pratt et al., 2010), may prove highly efficacious for studying and promoting PD. SCT would be particularly helpful in giving greater structure to investigating the Environmental (Social Support and Barriers), Behavioural (Outcome Expectations), and Cognitive/Personal (Knowledge, Goals, and Self-efficacy) factors that contribute to PD. In the model proposed in Chapter II these were described as Social, Personal, and Environmental variables. Self-efficacy in particular has been one the more frequently examined variables investigated in relation to PD through speaking up, though this has often be done in an

atheoretical manner, SCT can provide a structural framework for investigating self-efficacy. Separating out the different facets of self-efficacy could lead to a better understanding of how Experience (Performance Accomplishment), Mentorship (Modelling by others), Conformity and Obedience pressures (Social Persuasion), and Cognitive Load (Physiological and Emotional states) factor into self-efficacy related to PD. As there is no consistent, dominant, or comprehensive model for understanding obedience in healthcare in the literature, there are broad possibilities for development and innovation.

Simulation for Experimental Design

A growing body of evidence demonstrates the effectiveness of using simulation for studying obedience experimentally (Peadon et al., 2020). Most studies in the literature, including those that have examined obedience, or as it is more frequently discussed, barriers to speaking up, have primarily used simulation to observe the effect of different interventions or educational conditions. The present study, along with prior studies, shows the value of conducting an experiment in a simulated scenario to examine the effect of specific variables on behaviour (Barzallo Salazar et al., 2014; Friedman et al., 2015; Pattni et al., 2017; Sydor et al., 2013), though the present work emphasized theoretical underpinnings absent in the prior research. The present research took an approach to simulation akin to a psychological experiment differing from much of the prior literature that uses simulation as an environment to observe the effects of a pre-simulation intervention explicitly focused on communication or conflict management while emphasizing proper execution of procedural skills. Simulation as an environment for experimentation can help to understand team performance better. Simulation also provides an ideal scenario to study compliance using experiments with behavioural outcomes that can be difficult to measure in more general contexts.

Enhancing Rigour of IPECP Research

The present study follows the approach recommended by Kaba et al. (2016) to contribute to IPECP and teamwork literature by examining the negative aspects of group functioning. The present work also aligns with the needs and research priorities for IPECP of a more rigorous approach, the integration of evidence-informed strategies addressing the complexity of IPECP, and a basis in and translation of relevant theories, frameworks, and models (Khalili, et al., 2019b; Paradis & Whitehead, 2018).

The present study tells us more about how teams function by providing further support that authorities elicit obedience in health professional students through students' concern with competency and professional roles. Though the effect of obedience to authority seems apparent and obvious, it is important to study obedience through experimental means, such as in this study and others, to understand better how authority can influence team members in a healthcare context. Other methods, such as survey methods, can also be made more effective by incorporating elements to understand causative mechanisms.

Students and Multiple Professions

The differences between RT and ACP students are important for understanding how prior experience and individual differences influence behaviour in healthcare teams made up of people with diverse professional and personal backgrounds. Based on the present research (Chapters III, IV and V) and some existing research (Kim, et al., 2020; Sydor, et al., 2013) experience appears to have an important facilitating effect for PD, though it is still mostly inferential. The results in Chapter III where students report that experience helps with speaking up, are supported by the results in Chapters IV and V and the differences between ACP and RT students. The specific effect of experience needs more investigation: Is the supportive aspect of experience a general

effect, such as through time working as a healthcare professional? Is the effect related to procedural knowledge obtained through experience? Is the effect due to the level of independence with which a profession functions, such as ACP vs RT? Is the effect due to prior experience with compliance scenarios? Is the effect a product of chronological age and some interaction of other variables? These questions require further research.

The results of the study also demonstrated individual differences between members of the different health professions. Prior research examining personality has been done primarily in medicine, nursing, and pharmacy, and most of the research is descriptive and not associated with behaviour (Childs-Kean et al., 2020). Research on individual differences related to compliance has primarily explored self-efficacy (Roussin et al., 2018) though many other characteristics are open for exploration. To better understand different team members and professional variability related to compliance, measures such as Social Dominance Orientation (Tesi et al., 2020) and the HEXACO personality inventory could be used (Bègue et al., 2015; Bocchiaro et al., 2012). The HEXACO is a scale based on the lexical hypothesis, like the Big 5, measuring Honesty-Humility, Emotionality, Extroversion, Agreeableness, Conscientiousness, and Openness (Lee & Ashton, 2012). Continuing to understand individual differences between various health professionals can help predict behaviour in interprofessional and uni-professional teams.

Potentially, the most important result is showing within teams' obedience, and PD is complex, and hierarchies and power are not monolithic influences. The present work extends the findings of Sydor et al. (2013), Bould et al. (2015), Friedman et al. (2015), Pattni et al. (2017), and Delaloye et al. (2017), that indicates that in teams, the relationship among individuals is influenced by a complex number of variables, beyond just hierarchies. Other factors such as legitimate authority, Displacement of Responsibility, sex, Impression Management, moral

responsibility, cognitive load, and individual differences exert a strong influence on team members.

IPECP Training Focused on the Individual

This dissertation was informed by the idea of shifting the focus of IPE to the individual rather than teams. Much of the previous research has emphasized team training and group functioning, and system or professional cultural influences on behaviour (Mannion et al., 2018). Though the writing task did not have an effect, it was an attempt to change how an individual functions rather than how the team functions.

The focus on the individual was also emphasized through the assessment of Moral Foundations, experience, confidence, and the qualitative analysis of the debriefings. Other studies have looked at individual aspects such as self-efficacy, confidence, and assertiveness primarily as outcome measures related to an intervention (Daly Guris et al., 2019; Oner et al., 2018). As noted in relation to IPECP, more work is required to understand individual differences and personality to understand better who enters different professions. Knowing the differences across professions or how different personality traits and individual characteristics influence behaviour can help predict behaviour and individualize training. Prediction of behaviour is an essential aspect of developing theory, knowledge, and education (Bandura, 2005) and should have a more prominent role in psychological research (Orrù et al., 2020).

There are numerous interventions and tools to improve an individual's assertiveness, confidence, and speaking up skills (Ginsburg & Bain, 2017; O'Donovan & McAuliffe, 2020; Okuyama et al., 2014; Omura et al., 2017). Focusing on self-concept change and understanding individual differences, combined with existing tools accompanied by the cognitive advantage of an identifiable unit of change, an individual person versus healthcare as a whole, are important

for supporting a shift towards, and advancement of, training and education to produce good individual collaborators.

Patient Safety

Each of the previous four topics in this dissertation contributes to the need for continuous improvement in the study of patient safety. The product of the four chapters is increased knowledge about the individual, environmental, and social aspects of obedience in healthcare. More so, the four chapters, particularly the theories laid out in Chapter II, initiates a broader approach to understanding obedience. The need for continuous improvement in patient safety is met by promoting new approaches to compliance by incorporating existing knowledge from psychology that can lead to more theoretically informed work for understanding the problem of compliance.

Direct implications for education and practice to aid in the need for the continual improvement to patient safety are limited. The results primarily lead to more questions that require investigation to develop practical implementations, such as for self-concept change through the expanded writing task. However, there are two directly applicable ways the need for continuous improvement is fulfilled. First, the results in Chapter V have implications regarding the use of communication tools for PD. The use of a concise, simple, and consistently applied communication tool, such as CUS, across professions and contexts can simplify PD and allow for a common language and shared mental model about what the specific act of speaking up entails. CUS is a method to alert others to your concerns and identify safety issues that involve, in escalating order, stating I am Concerned, I am Uncomfortable, this is a Safety Issue (Gerstle, 2018). If a person has asked questions and made suggestions that are not well received or ignored, then they could use CUS. Second, the demonstration of the use of a simulated obedience

situation as a method to support and reinforce training on PD. A simulated scenario can create opportunities to discuss compliance and allow students to practice PD, including the use of tools for speaking up such as CUS, before entering practice.

Limitations

There were several limitations to the present body of work. Many of the specific limitations are addressed in the individual chapters, some are recapitulated below, and others are broader.

The sample size was limited for the survey study, though the sampling frame included data collected from multiple institutions and a wide range of health professional programs. In part, the limited sampling was due to the need to promote the survey after distribution and the length of the survey. One hundred and two participants started the survey though only 67 students completed the survey, including those sampled at a simulation event. A likely factor for the low response rate is survey fatigue. Post-secondary students are consistently inundated with surveys and are among the most surveyed populations in society, leading to low response rates and low engagement (Van Mol, 2017). A different recruitment approach, such as offering class time, linking the survey with an assignment, and providing compensation to participants, would likely have improved the response rate. Despite the small sample size, the study was exploratory and not intended to be comprehensive. Though exclusively in medicine and nursing, other surveys have established comparable frequencies to those in Chapter III, indicating the results are likely reliable and generalizable.

For the experimental study, there were four key limitations and improvements that could be made to improve the simulation's overall quality. First, the simulation could have benefitted from using an Objective Structured Clinical Exam (OSCE) style pre-briefing where the scenario

was presented in writing outside the simulation room instead of delivered by the facilitator. Using an OSCE style pre-briefing would have eliminated any variability in the delivery of the pre-briefing message by facilitators. The OSCE style pre-briefing would assure greater procedural consistency and uniformity in pre-briefing delivery, minimizing possible facilitator influences. This would be beneficial if there is a single facilitator or multiple facilitators.

Second, a Confederate Hierarchical Demeanor rating, such as used by Delaloye et al. (2017), could have also been implemented. Using a measure of demeanor would allow for examining an effect of scenario by SP. Relatedly, a measure of cognitive load through an instrument such as the NASA Task Load Index (NASA-TLX) (Said et al., 2020) completed by participants could have been used to obtain a continuous measure of the cognitive load created in the scenario. Using the NASA-TLX (Said et al., 2020) would have also helped develop the simulation's external validity through potential comparison with “real-world” scenarios. Despite the limitations, during debriefing students generally reported the simulation felt realistic and elicited an emotional response, a stress response, and had a “butt pucker” factor. Future studies could use engagement and stress measures such as the NASA-TLX (Said et al., 2020) to compare different simulation protocols and design progressively more cognitively demanding scenarios. Using progressively demanding scenarios would allow for an understanding of the relationship between environmental effects on arousal and performance, for example, the possible Yerkes-Dodson effect. Stress, emotion, and learning are complex, with much to still understand.

Third, the simulation could have contained a more structured format with specific points where a challenge was expected or should occur, similar to other research designs that have examined speaking up. Rather than have the design be driven by the procedure and assessment

method, as in other studies, it was an open environment where instead of procedural accuracy in identifying specific incorrect actions, interpersonal interaction was the focal point. Further, using a categorical measure, yes/no PD, allowed the simulation to reach boundary areas for how far the student would let the doctor go in a dangerous scenario without engaging in PD. The categorical approach allowed for observation of the extent of a person's willingness to engage in a challenge, such as physical intervention. Still, a scale such as the modified Advocacy Inquiry Scale (mAIS) (Delaloye, et al., 2017; Pian-Smith et al., 2009; Sydor et al., 2013) could have been used in conjunction with the categorical rating. Inclusion of the mAIS would have provided a further refinement to understanding PD through speaking up by using a continuous measure of student behaviour that would allow for comparability with previous research

The open environment approach, opposed to an algorithmic design with specified points for error and challenge, and a binary outcome for PD made coding more challenging than if an algorithmic design and assessment scale, such as the mAIS, was used. However, the approach taken allowed for a range of behaviours and actions to be observed. Good interrater reliability was achieved on the first round of coding. There is no consensus measure for assessing PD or speaking up in the literature, and more ecological or observational approaches can be valuable for operationalizing and ultimately measuring the construct (Noort et al., 2019). A feedback loop exists when operationalizing a construct, such as PD, and implementing a universal method for assessing PD could be useful. The operationalizing feedback loop cycles through how the construct is understood, how it is taught, how it is measured (assessment), and how it is understood.

Fourth, during the debriefing for the simulation, facilitators did not always follow the interview scripts directly. The researcher instructed facilitators to read the scripts verbatim,

though several facilitators mentioned following a script and asking specific questions did not feel natural. The facilitators are used to debriefing in their own way and not following a script.

Though facilitators were instructed to read the scripts verbatim, and prompts were included for some questions, better training for the facilitators, particularly instruction on asking probing or follow-up questions, would likely have produced consistently richer interviews.

A second iteration of the study reported in Chapters IV and V was planned for March 2020 to address many of the limitations and implement improvements. The second study was cancelled and did not occur due to the COVID-19 pandemic.

CHAPTER VII: IMPLICATIONS AND FUTURE DIRECTIONS

This chapter presents implications and avenues for future research and health professional education with the goal of improving patient safety. Future directions should focus on selecting the individual, social, and environmental factors most relevant to the context while incorporating new results.

Research

Future implications and directions for research involve the inclusion of theory, longitudinal approaches, targeting influential variables, shifting the perspective of hierarchies and obedience, and new theoretical understandings of obedience. Although the literature on compliance is growing and some theories from psychology and business have been applied, much of the healthcare professional education literature is atheoretical. Post-hoc inductive/abductive interpretation of data using Exploratory Data Analysis through methods such as Data Mining can support theory development and lead to new research questions (Hong et al., 2020; Tukey, 1980), but using experimental methods without a basis in theory challenges the utility and interpretability of the data. For testing hypotheses in a deductive manner, a framework of knowledge within which effects are interpreted is required. Through the falsification of hypotheses derived from theories, evidence or explanatory value can be determined (Popper 1959). Approaching a problem from a theoretical position with a structured set of knowledge and ideas to explain or interpret facts, events, or data through hypothesis testing allows for the advancement of knowledge and support for, or disconfirmation of, a theory (Popper, 1959; Stroebe, 2016). Future research in compliance in health professions needs to expand its purview to include knowledge from other areas and apply and test theories in a systematic way. Though it is not codified as a theory, the social constructivist, postmodernist perspectives of pure power

and hierarchical influence that are prevalent should be supplanted by theories of Bounded Rationality (Simon, 1955), Social Influence (Loh & Ren), Moral Foundations Theory (Haidt, 2001), Social Cognitive Theory (Bandura, 2005), and Behavioural Organizational theories (Pina e Cuhna, et al., 2010).

A significant methodological need, regardless of the theoretical perspective, for understanding compliance in health professions is a longitudinal approach. Conducting longitudinal analysis will help understand how compliance behaviour changes as people progress through education and practice. Longitudinal analysis can provide insight into the effects of programs, individual differences, past experiences with compliance, and accrual of knowledge and status. Longitudinal study will help clarify how past experiences support or inhibit PD and how prior experience influences the type of practitioners and educators people become in the future. Following people through education and practice will also provide insight into the development of professional cultures and related aspects of culture, such as the Hidden Curriculum. It will be possible to answer questions about how systems change over time and what influence people have on that change. For example, does the promotion of psychological safety lead to increased PD among students who then develop into educators that create psychological safe learning environments and ultimately change the professional culture?

Longitudinal study is also crucial for understanding the effect of an educational intervention. Much of the research on speaking up and assertiveness interventions is cross-sectional, and the long-term impact is generally unclear. The development of lasting interventions, potentially through self-concept change supported by simulation training that reinforces the behaviour, will be necessary to create stable change. Longitudinal study, including observational research, will develop external validity for training and how it applies, or does not

apply, in practice. Reciprocally, future education can be tailored based on the findings to better match the practice environment.

While longitudinal analysis is an essential methodological advancement, there are other variables to explore to inform the understanding of compliance. Collecting physiological response data combined with the longitudinal study of following participants into practice can help understand the stress response experienced by people in compliance situations. The intensity of the stress response can be important for understanding possible physical responses resulting in burnout (Marchand et al., 2014; Wheeler & Dippenaar, 2020). Additionally, physiological response data can be used to develop external validity and generalizability for simulation. Can simulation create a physiological stress response that adequately matches practice conditions? Another primary variable to explore is the use of a direct request. The direct request condition has been used in previous studies (Delaloye et al., 2017), but continued examination is necessary. For example, what are the boundary conditions of a request that will elicit obedience – how minimal or extreme can the request be? Could unintentional or intentional, door-in-the-face or foot-in-the-door techniques and other reciprocity norms create obedience through a direct request (Genschow et al., 2020)? The possible interactions of a direct request with other variables presents a range of possible conditions for examination.

When challenging an authority there is generally no effect for the sex of the person making the challenge, but the sex of the authority can matter (Blass, 1999). Pattni et al. (2017) found the sex of the authority influences speaking up, where female anesthetists were challenged more frequently, although no sex effects were found for the person speaking up. Roussin et al. (2018) found female nurses and physicians spoke up more frequently than males to a colleague that made a mistake, but no sex effects were found for speaking up to a faculty member. Both

studies support the prior findings of sex and obedience (Blass, 1999). Sex effects for the person speaking up may still occur depending on the conditions, context, and culture. An interesting approach would be to examine how sex and attractiveness can interact to facilitate obedience. Does an attractive physician, or other professional, of the opposite sex elicit obedience through a direct or implicit request at a greater rate than a less attractive one? In addition to sex, biological, demographic, and personality variables could be measured. For example, Right-Wing Authoritarianism (Bocchiaro & Zimbardo, 2017), the Traditional Moral Values Triad of Authoritarianism-Religiousness-Conservatism (Bouchard, 2004, 2009), and the Authoritarianism-Conservatism-Traditionalism (ACT) (Duckitt et al., 2010) models have been shown to relate to obedience to authority and likely have explanatory value as a supplement to Respect for Authority conceptualized through Moral Foundations Theory. Understanding more about the traits, values, and attitudes of healthcare professionals would be invaluable in predicting performance and behaviour for compliance and almost any other aspect of healthcare education and practice. Developing an understanding of traits, values, and attitudes could begin with creating a “personality profile” of different professions.

To better isolate and understand the differing effects of variables, a stepwise method of investigation comprising several small studies progressively examining different variables would be ideal. By conducting several studies, it would be possible to parse apart the components of obedience and understand how each function in isolation. Ultimately a simulation incorporating the most powerful elements of obedience could be constructed to determine the influence of the effects in relation to each other. A maximum difficulty simulation would help explain which main effects are the most important and how the variables interact.

As discussed throughout, hierarchies are not arbitrary social constructions, but rather are universal and innate forms of human social organization that work to maintain group structure, function, and survival by maintaining social rules through respect for authority (Chase et al., 2002; Magee & Galinsky, 2008; Preston & de Waal, 2002; Zitek & Tiedens, 2012). The accumulated evidence in the present dissertation, evidence from several studies (Bould et al., 2015; Friedman et al., 2015; Sydor et al., 2013), and the variable evidence for the effects of interventions (Omura et al., 2017; Pattni et al., 2019) indicates hierarchies as a *sui generis* cause of obedience and for not engaging in PD is inaccurate. The social constructivist, hierarchy and power position needs to be re-evaluated. Further investigating uni-professional and interprofessional teams in health professions outside of medicine and nursing is also necessary. Patient care occurs across multiple levels of health systems. Allied health professionals make up a substantial proportion of the healthcare system and interact in interprofessional teams. By not including these professionals in experimental research there are a substantial proportion of people that are subject to the same effects, possibly to a greater extent, for who research and education on compliance, PD and speaking up is absent.

Education

A possible program or curricular approach can be taken to incorporate self-concept change for increasing PD. For health professional education, standardized and widely applied interventions incorporated into existing curriculum and systematically evaluated could increase the efficacy of interventions to increase PD. Despite the lack of an effect for the writing task, educational implications can be derived from the research. There were several likely reasons the writing task was not effective and three primary ways in which the writing task could be modified and improved to achieve the goal of self-concept change by applying the consistency

principle. Incorporating self-concept change methods with simulation and existing interventions could further solidify the ability to engage in PD.

The first modification is to make the purpose of the writing task explicit. In the approach used, the writing task was masked as a part of a personality measure to improve simulation personalization. Deception was used to avoid any guessing about the true nature of the simulation to obtain naturalistic responses and was important for examining CL and other variables. The deception was effective, though it may have reduced the writing task's impact by reducing the salience and importance of what students were writing about, and the self-concept change was not evoked. Framing the writing task within existing education for PD and speaking up, such as during TeamSTEPPS (Clapper, 2018; Daly Guris et al., 2019; Oner et al., 2018), or a similar program, could be more effective. The writing task may be taken more seriously, and students would better incorporate what they were writing into their self-concept.

The second way the writing task could be improved to promote self-concept change and learning is by increasing the level of commitment required for the task. The writing task could be extended to an assignment, such as an essay or presentation where the student is required to review literature, develop an argument, provide a rationale and evidence, and focus on a representative case (Kahneman, 2011; Lehmann et al., 2019; Nisbett & Borgida, 1975; Nückles et al., 2020). The writing task should incorporate a requirement to investigate the literature that explains the psychology of compliance to promote understanding beyond procedural approaches or tools for PD. The knowledge aspect of the writing task would be valuable on its own. Out of all the participants, only two indicated any prior knowledge relevant to their behaviour (Chapter V). Participants were not explicitly questioned on recall of prior knowledge, and it is possible others remembered cases or tools. Compliance scenarios are important and will affect students,

though most students did not seem to have a great deal of awareness of the problem beyond a vague knowledge. While knowledge on its own is valuable, it does not yet move fully past the knowledge-rationality approach to improving PD.

The final aspect that should be used in conjunction with an explicit purpose and generating information and arguments is for students to present to classmates, instructors, patients, and others on compliance, PD, and speaking up. This final step will help solidify the need for consistent behaviour, a fundamental social heuristic (Bocchiaro & Zimbardo, 2017). Making public statements and expressing knowledge about the problem and how to act will create a social obligation to engage in PD to demonstrate consistency in thought, action, and self-concept to fulfill the goals of accurate behaviour, social inclusion, and self-concept maintenance (Cialdini, 2009). The expectation from peers and others that the person will behave consistently with the professed opinions will reinforce PD as engaging in PD will indicate that the person is trustworthy and reliable.

To further reinforce principles imparted throughout the proposed intervention the testing effect could be utilized. Formative testing coupled with feedback could enhance content retention (Kang et al., 2007; McDermott, et al., 2014). As the continued practiced recall makes the concepts more salient self-concept change may be enhanced. While as noted it is not expected that knowledge alone would enhance behaviour if the information related to speaking up is made more strongly encoded it may be more salient when it must be recalled (Roediger, et al., 2011). The present study hypothesized that the writing task alone would be sufficient to achieve this effect. The expanded method would likely be more effective, incorporating inductive learning elements, recall, including inquiry/discovery, case-based, and project-based learning (Prince & Felder, 2006).

A part of any implementation would also be extensive faculty development. To be able to guide instruction on PD and train students for speaking up and using the tools necessary faculty would need to be well versed on not only patient-advocacy but also on the psychological principles underlying obedience and conformity. As reported in Chapter III, students thought that in addition to personally receiving more education on speaking up instructors needed to be more receptive to differing opinions and should receive training on how to do so. If a standardized curriculum was instituted, it would be necessary to provide widespread faculty development on the content as well as how to adapt it to the requirements of the specific professions being trained. Training and adaptation would be particularly important if simulation is incorporated.

Though this was an experimental study, it appears there was a positive learning effect for the students that participated (Chapter V), indicating similar methods can be useful for teaching the principles of compliance and group dynamics and practicing PD. In Chapters III and V, students indicated a desire for more knowledge about PD and speaking up. During the post-simulation debriefing, students conversed with facilitators about compliance, what occurs in practice, and methods to deal with compliance. These results indicate simulation is an opportunity to provide and encode the knowledge students are seeking. Using the expanded writing task delivered as Just in Time Teaching (Prince & Felder, 2006) could be effective pedagogically and practically for a simulation scenario. Combining the writing task with simulation would allow students to practice PD, have experience with a compliance scenario, develop expectations for how they might react in the future, and have the knowledge to understand and discuss behaviour. The personal experience would also function as a representative case that would help incorporate knowledge into a causal story to solidify the intervention's effect (Kahneman, 2011a).

Monteiro and Sibbald (2020) discussed how simulations are misused and critiqued the efficacy of simulation training that utilizes surprise or does not provide learners with full knowledge about the simulation's purpose and relies on debriefing for teaching. Monteiro and Sibbald (2020) focus on simulation for technical skills, finding the primary fault being misapplication of Kolb's experiential learning theory and discovery learning through poor lesson planning, poorly or undefined learning objectives, and a lack of follow up or active skill development. Simulation used for teaching about compliance in a scenario with an element of surprise or unexpectedness should not be evaluative or focused on performance, but rather function as an experiential object lesson incorporated as a part of broader education on compliance. Using the enhanced writing task with increasing levels of commitment to help students develop knowledge about compliance and PD with a focus on relevant psychological principles can precede simulation as an opportunity for experiencing a compliance scenario. To further solidify self-concept modification and the need for consistency simulation can be incorporated to align with through information feedback in the Kolb/Lewinian cycle of experiential learning through Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation (Kolb, 1984). In more detail the application may look like:

Abstract Conceptualization would occur using the enhanced writing task and its progressive stages, including formative assessment. Videos of peers at a professionally equivalent level making a challenge could be included.

Active Experimentation would involve practicing using the skills and tools learned in a low stress role playing scenario. Students would provide feedback and support to peers on the use of the skills and tools.

Concrete Experience would occur through participation in a high-impact simulation, with only a single student participating. Solo participation is important, so that individual action is required and there is no influence from peers. Additionally, in the case of poor performance, it will not be in front of peers. To make the simulation as authentic as possible it should be delivered without forewarning with reasonable time elapsing after Active Experimentation.

Reflective Observation would occur during simulation debriefing. Debriefing would review the student's performance and provide support for improvement while tying the need for PD back to the realities of practice and the information delivered during Abstract Conceptualization (Sawyer et al., 2016).

The cycle should continue through follow-up classroom discussions that reinforce what was previously learned about speaking up and patient advocacy (Abstract Conceptualization) with opportunities to practice speaking up in the future, ideally through simulation (Active Experimentation).

Friedman et al. (2015) believe one of the main problems for speaking up is not enough appropriate conflict management training. More conflict management training is likely not detrimental, though the efficacy is variable (O'Donovan & McAuliffe, 2020; Omura et al., 2017; Pattni et al., 2019). Instead, training based on knowledge about group dynamics and what influences compliance is more appropriate. An intervention delivered to pre-licensure learners based on self-concept change incorporated with an understanding of how compliance functions could be self-reinforcing and ultimately require less training and continuing education. Creating self-reinforcing behaviour aligns with Holmes et al. (2014), though the mechanism differs.

An active, effortful, task-specific, and integrated approach as proposed will likely be effective for improving speaking up. Elements of the proposed approach have been used in two

recent studies with both studies' showing some benefit for speaking up. Daly Guris et al. (2019) used an intervention with several novel elements integrated within TeamSTEPPS. The intervention included background on Crew Resource Management and representative cases like United 173 and Elaine Bromiley. Oner et al. (2018) also used TeamSTEPPS to incorporate an intervention that included participants reflecting on potential outcomes for a patient in a compliance scenario where a challenge did not occur and generating possible reasons for the non-challenging. Role-playing was conducted in a scenario that required assertive action. Daly Guris et al. (2019) presented the material didactically during a lecture-based training session, and Oner et al. (2018) used group reflection and non-task-specific role-playing. Simulation was used in both studies to evaluate the effect of the intervention.

Simulation for learning about compliance could also be beneficial by using standardized curriculum and standardized simulation formats. A base standardized simulation scenario could be developed that meets the curriculum learning objectives that can be modified to match the tasks of different professions. The training and simulation could be delivered across programs nationally to provide all healthcare professionals with common knowledge and language to understand compliance and PD. Throughout the modules of TeamSTEPPS, elements of this approach exist, including shared mental models, tools such as CUS and the two-challenge rule, and situation monitoring. Incorporating the writing and presentation task and specific compliance simulations within Module Six of TeamSTEPPS, Mutual Support, could be an ideal format for widespread implementation.

If a standardized intervention or curriculum is developed, it can be tested, evidence of validity can be gathered, refinement can occur, and it will be possible to determine if the curriculum has any actual influence on patient safety. The first determination of influence on

patient safety would be the observation of behaviour in simulated scenarios, do HCP engage in PD in challenging simulated compliance scenarios. The next step would be more difficult but more absolute. Direct observation should be used in clinical practice with those that have undergone the proposed education compared with those that haven't. This would only likely be practical with small samples, self-report measures could be used as a less reliable though easier means to supplement observational investigation. The need to incorporate many stakeholders, numerous administration levels, differing values, opinions, and changes in evidence would make such a program challenging. Despite the challenges, with the recent growth in literature and awareness of the challenge of negative compliance, especially 20 years on from *Too Err*, the timing is suitable for attempting new methods and approaches to improving patient safety (Cohen & Patel, 2020).

Despite the desire for perfect engagement in PD at the appropriate time, in any case of negative compliance, the power of the situation, human dispositions, and complex environments means that even an optimal intervention will still not be totally effective, or effective most of the time. What can occur is that better knowledge and understanding of the problem can lead to interventions that create consistent incremental improvements across healthcare systems that cumulatively account for large reductions in patient harm.

Patient Safety

Finally, when taking a finer-grained approach to understand group dynamics in healthcare and the effects related to compliance, it will be necessary to ensure a focus is kept on the ultimate goal of improving patient safety. Work that becomes too theoretically focused could quickly lose sight of educational and patient safety implications. Any development of a theory of compliance in healthcare should have a focus on outcomes for patient safety.

Multiple methods for improvement in patient safety should also be used. The individual focus may be advantageous over wholesale culture/system change where the effects of organizational inertia make change difficult (Habersang et al., 2019). However, the argument for individual change does not mean that changes in systems should not be attempted. Bottom-up and top-down implementations may work at variable rates, though improvements from either are valuable.

CONCLUSION

The challenge of compliance and PD in healthcare is more complicated than has been assumed or the approaches taken to understanding it have attempted. In a 2020 review article, Peadon et al. state: *“In the context of workgroups and professional hierarchies, raising safety concerns is a socially constructed phenomenon. There are a number of the critical organisational and hierarchical characteristics that influence whether doctors speak up, as well as the outcomes, or concern for outcomes, that stem from their actions.”* This statement shows the inadequate understanding of the problem, disregarding individual differences and that the innateness of obedience to authority is a well-established phenomenon (Bouchard, 2009). Hierarchies are not simply socially constructed phenomena but exist across all social animal groups, including humans, as the preferred form of organization (Chase et al., 2002; Chiao et al., 2009; Halvey et al., 2011; Koski et al., 2015; Magee & Galinsky, 2008; Milgram, 1963, 1974; Nisbet, 1966; Zitek & Tiedens, 2012). Innate dispositions and behaviours influence social organization. The strictly social constructionist perspective is appealing because if something exists because it is a social convention, rather than having a biological origin, things can be changed to the way we think they should be (Boghossian, 2006). The literature unknowingly makes the empiricist claim of the ‘Standard Social Sciences Model’ that the human mind is

content-free and only composed of a few cognitive processes for learning, a blank slate (Cosmides & Tooby, 1994; Pinker, 2002). The perspective that hierarchies, obedience and other related phenomena are innate rather than socially constructed is unappealing due to the naturalistic fallacy that what is natural is good. If hierarchies and obedience can be negative or detrimental, then it should not be possible for them to be natural (Pinker, 2002).

The research presented in this dissertation has attempted to establish the complexity of obedience within a health context and how the innate disposition towards obedience interacts with social, individual, and environmental forces to produce compliance. Chapters I and II outlined some of the behavioral and psychological knowledge of the internal mediating mechanisms of the obedience heuristic while Chapter III surveyed the environment of application of obedience and influential variables. Chapters IV and V tested obedience in a simulated environment to determine if and how obedience would be enacted. Finally, Chapters VI and VII revisited and refined the knowledge of obedience and presented future possibilities for refinement and education.

To move beyond overly simplistic interpretations of hierarchies as *the* explanation for obedience it is important to understand post-hoc moral justifications, social influences and the power of the situation, and the complexity and limitations of cognition and behaviour that influence how hierarchies' function. Interventions to improve PD, or speaking up, may be more consistently effective if some of the attendant theories that explain the phenomena are incorporated. The challenge is to avoid collapsing a complex multivariate world into a univariate one.

Professional cultures, hierarchies, and teams are highly important areas of research for patient safety. Approaching the phenomena through social-cognitive psychology, or behavioural

science, has better explanatory and predictive value and is much more interesting and profound. From the influence of cognitive load and Moral Foundations to people that may use harsh tactics to elicit compliance, there is a broad frontier of research possibilities to explore to improve team functioning and patient safety.

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APPENDICES**APPENDIX A: CHAPTER THREE****Consent Form**

Study Title: An Exploratory Survey of Health Sciences Students' Experiences and Perceptions of Conformity and Obedience

Research Investigator:

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Project Supervisor:

Dr. Sharla King

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Background:

This project is a part of the researcher's thesis work at the University of Alberta. We are asking for your voluntary participation in this survey to help us better understand the experiences of Health Sciences Students and their interpersonal and group relations. The results of this study will be used by the research investigator to inform future work related to their thesis project as well as be submitted to academic journals, and conference presentations.

Purpose:

The purpose of this study is to determine what, if any, experiences students in the Health Sciences have with conformity and obedience as well as how they feel about these experiences. This research will have the benefit of identifying to what extent students experience conformity and obedience and will subsequently inform future research attempting to understand how conformity and obedience occur and what can be done to improve these situations when there are potential negative outcomes.

Study Procedures:

This is an online survey hosted on the website Qualtrics. The survey will consist of a set of questions about the frequency of your experiences with conformity and obedience as well as your perceptions regarding these concepts in your learning and professional environment. Completing the survey will take approximately 20-25 minutes. If you consent to participate you will be directed to the survey where you will first be presented with some short stories and brief questions regarding these stories. You will then proceed to questions asking about your experiences. The questions will primarily be rating scales. At the end of the survey you will be provided with space to provide any further thoughts regarding the content of the survey.

Potential Benefits and Risks:

The participants of this study will not receive any compensation for participation. There will not be any benefit of participating in this study related to course grades. There will be no other immediate benefit to participation in this study though the information gathered will help to potentially inform and change curriculum for students in the Health Sciences. There are no foreseeable risks or costs to participating in this study though thinking of some past situations may cause distress to participants. Participation is entirely voluntary, in the case participants

experience any distress they may end their participation at any time. If you experience any distress and would like to seek support information for counselling services is provided below:

Counselling and Clinical Services: 2-600 Students' Union Building (SUB), next to the Myer

Horowitz

Phone: 780-492-5205

Website: <https://www.ualberta.ca/current-students/counselling>

Hours: Monday, Thursday & Friday 8:00 a.m. – 4:30 p.m; Tuesday and Wednesday 8:00 a.m. –

7:00 p.m

Voluntary Participation:

You are under no obligation to participate in this study. Therefore, the participation is completely voluntary. You can opt out without any penalty.

Confidentiality & Anonymity:

The research will be used for a thesis/dissertation, research articles, and conference presentations. Participants will not be identified in any situations. The data will be kept confidential, only the principal investigator and their supervisor will have access to the data

Anonymity can be guaranteed as no identifying personal information will be collected. All participants data will be completely anonymous through all stages of the research and all data will be deindividuated. As the data will be completely anonymous and deindividuated after the survey has been completed and submitted it will not be possible to remove individual participants data.

Data will be kept on a secure account hosted on the website Qualtrics and a secured hard drive.

Access to Qualtrics is password protected and encrypted. The data will be held for a minimum of

5 years following completion of the research project. Data will be destroyed by deletion of the database holding the data on Qualtrics as well as the hard drive. You should know that while we will keep the information you give us confidential - in the United States under US privacy laws, the government has the right to access all information held in electronic databases.

If participants want, they can receive a copy of a report of the research findings by contacting the principal investigator through the email indicated on this consent form.

Further Information:

If you have any further questions, please do not hesitate to contact the research investigator Efram Violato (violato@ualberta.ca). The plan for this study has been reviewed for its adherence to ethical guidelines by a Research Ethics Board at the University of Alberta. For questions regarding participant rights and ethical conduct of research, contact the Research Ethics Office at (780) 492-2615.

Consent Statement:

I have read this form and the research study has been explained to me. I have been given the opportunity to ask questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree to participate in the research study described above and will receive a copy of this consent form. I can download a copy of this consent form. By selecting the option *I Agree* in the survey I consent to participate in the study.

Compliance Behaviour Survey

Introduction: Throughout this survey you will be presented with questions based on your experiences, your perceptions and some demographic information. For each question please

select the answer that you feel is most applicable to you or best represents your experiences. You may decline to answer a particular question, in this case leave the question blank and complete the questions you feel comfortable answering.

In the first section of this survey we will present you with four brief stories. Please read each story carefully and then respond to the questions.

Story 1: Tom is taking a workshop about how to treat mild burns. During a portion of the workshop there is a simulated case study session with a mannequin where an instructor, who is an emergency room doctor, provides one on one advice on how to treat different burn cases. The simulation case Tom has been assigned to is a first aid situation that involves a burn on a person's forearm that has begun to blister. The blister has swollen to a large size and Tom is trying to apply a clean bandage, but the blister is making it difficult to apply the bandage. The instructor watches Tom struggle and then advises him to "break the blister" so that it will be easier to apply the bandage. From the pre-course material that Tom read and from a previous CPR course Tom took he knows that you should never break a blister when providing first aid. Tom responds that he does not think this is correct. The instructor responds in a clear voice that Tom should break the blister. Tom follows the instructor's directions and breaks the blister.

Story 2: Steven was with a group of three other students from his class. The group was learning how to take a Resting Pulse and Resting Respiratory Rate from a patient. Before beginning to take measurements, the instructor told the group how important it was to take accurate readings as these would impact the care a patient receives. As each student took turns measuring the Resting Pulse and Resting Respiratory Rate for the patient they were asked to state each measure out loud so their instructor could record the results and verify if they had taken the correct

measurements. Nicole went first and read out the resting pulse as 56, and respiratory rate as 22, the instructor marked down the readings. Dallas went second and indicated the resting pulse was 58 and the respiratory rate was 24. Li was third and stated the resting pulse was 58 and the respiratory rate was 22. Steven was last and as he took the readings from the patient he obtained a resting pulse of 70 and a respiratory rate of 17, unsure of his measurements he took them again and received the same numbers. Steven then stated to the instructor that the resting pulse was 57 and the respiratory rate was 23.

Story 3: Jane is in a basic anatomy class. In this class the teacher likes to call on students to provide answers, the teacher will often call a student by name to answer a question. At the beginning of each class the teacher reviews material from the previous class. The previous class was regarding the muscles of the leg. As the teacher is going through the muscles of the leg the teacher asks several students in a row to indicate the proper anatomical structure of a muscle before indicating if the students answer was correct or not. The teacher asks Brad, Kat and Jane where the insertion of the biceps femoris is. Brad responds first that it is the head of the *tibia*, Kat replies next and with confidence gives the same answer as Brad. To Jane, Brad and Kats answer doesn't sound quite right, she is fairly certain the insertion is at the head of the *fibula*. Jane has paused for a second and the teacher is looking at her, so she gives the same answer as Brad and Kat.

Story 4: Natalie is a health sciences student working as a caregiver at an assisted living facility during the summer. When Natalie first started at the assisted living facility she was mostly helping the residents get around, making sure they were comfortable and ensuring that they received their meals. Since Natalie had shown herself to be very responsible the nurses at the facility have been giving her more and more responsibilities. In the last couple of weeks, she had

started administering medication to patients. One day while Natalie was working at the front desk of the nursing home a call came in. The call was from a person identifying themselves as Dr. Campbell, Natalie had never met a Dr. Campbell while working at the assisted living facility. Dr. Campbell stated that he was the physician assigned to the facility and he was based at a local clinic. Dr. Campbell stated that it was necessary for one of the patients, Mrs. Boon, to receive 5mg of Risperidone at meal time and administration should begin that day. At the next meal time Natalie gave 5mg of Risperidone to Mrs. Boon.

This next section will deal with questions of Conformity.

Instructions: Conformity is the matching of attitudes, beliefs or behaviours to group norms. The different groups that we may conform to could include society, family, our class, our friends, or even a crowd at a sporting event or shopping center.

Examples of Conformity would be the situations such as those described for Jane, where she gave the same answer on an anatomical question as her classmates, or Steven, where he gave a Respiratory Rate and Heart Rate close to the ones given by his classmates.

These are only examples and you may think of very different experiences.

As you think about the questions below we would like you to think about the questions in terms of your education and professional development as a health professional. Within this guideline the situations you think of can be diverse and varying, the settings could range from a classroom

experience to a patient care setting such as in a clinic.

Many health professionals have reported experiencing these kinds of situations

1. Please estimate in the past **WEEK** how many incidences you can recall where **YOU** acted based on how one or more other people behaved?

0 1 2 3 4 5 6 7 8 9 10

Please Indicate (1)	
---------------------	--

2. Please estimate in the past **WEEK** how many incidences you can recall where you observed a **PEER** acting based on how one or more other people behaved?

0 1 2 3 4 5 6 7 8 9 10

Please Indicate (1)	
---------------------	--

3. Please estimate in the past **MONTH** how many incidences you can recall where **YOU** acted based on how one or more other people behaved?

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Please Indicate (1)	
---------------------	--

4. Please estimate in the past **MONTH** how many incidences you can recall recall where you observed a **PEER** acting based on how one or more other people behaved?

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Please Indicate (1)	
---------------------	--

5. Please estimate in the past **SIX MONTHS** how many incidences you can recall where **YOU** acted based on how one or more other people behaved?

0 5 10 15 20 25 30 35 40 45 50

Please Indicate (1)	
---------------------	--

6. Please estimate in the past **SIX MONTHS** how many incidences you can recall where you observed a **PEER** acting based on how one or more other people behaved?

0 5 10 15 20 25 30 35 40 45 50

Please Indicate (1)	
---------------------	--

Next we will ask you some questions about your experiences with conformity.

1. Have **YOU** ever carried out a task without being certain of the proper method yourself because you saw a peer do it that way?

Yes (1)

No (2)

2. To what extent do you feel that **YOU** are “going with the crowd” when you need to perform a procedure or technique?

	Never (1)	Sometimes (2)	Often (3)	Most of the time (4)
Please Indicate (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Have you ever witnessed a **PEER** carry out a task because other people did it that way but you did not think that it was the correct method to use?

Yes (1)

No (2)

4. To what extent do you feel that your **PEERS** are “going with the crowd” when they need to perform a procedure or technique?

	Never (1)	Sometimes (2)	Often (3)	Most of the time (4)
Please Indicate (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Do **YOU** ever feel you need to alter your behaviour to align with the behaviour of those around you?

Yes (1)

No (2)

6. Do **YOU** ever feel that you need to alter your thinking to align with the thinking of those around you?

Yes (1)

No (2)

For the final questions about Conformity we will ask you about some of your perceptions of Conformity.

1. In your education to what extent do **YOU** feel that you need to “fake it until you make it”?

	Never (1)	Sometimes (2)	Often (3)	Most of the time (4)
Please Indicate (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Are **YOU** ever concerned with how your peers or teachers view you professionally?

	Never (1)	Sometimes (2)	Often (3)	Most of the time (4)
Please Indicate (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. To what extent do **YOU** feel confident in your knowledge even when a peer may disagree with you?

	Not at all (1)	Very Little (2)	Somewhat (3)	Completely (4)
Please Indicate (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. To what extent do **YOU** wish to be viewed as a typical member of your profession?

	Not at all (1)	Somewhat (2)	Highly (3)	Completely (4)
Please Indicate (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

This next section will deal with questions of Obedience

Instructions:

Obedience to authority is defined as being compliant with an order, request, direction or instruction from a person who holds a position of authority over you. Often people in positions of authority can be thought of as those who are above us in a hierarchical structure. A person's authority may come from formal or informal, legitimate or illegitimate means. A person in a formal position of authority may be a professor or a police officer. A person in an informal position of authority may be a parent or person a year or two ahead of you in your program.

Examples of Obedience to authority would be situations such as those described for Tom, where he "burst the blister", or for Natalie, where she administered medicine after receiving instructions from Dr. Campbell. These are only examples and you may think of very different experiences. As you think about the questions below we would like you to think about the questions in terms of your education as a health professional. Within this guideline the situations can be diverse and varying, the settings could range from a classroom experience to a patient care setting such as in a clinic. Many health professionals have reported experiencing these kinds of situations.

1. Please estimate in the past **WEEK** how many incidences you can recall where **YOU** acted on the instructions of an authority figure that you did not believe was correct?

0 1 2 3 4 5 6 7 8 9 10

Please Indicate (1)	
---------------------	--

2. Please estimate in the past **WEEK** how many incidences you can recall where you observed a **PEER** acting on the instructions of an authority figure that you did not believe was correct?

0 1 2 3 4 5 6 7 8 9 10

Please Indicate (1)	
---------------------	--

3. Please estimate in the past **MONTH** how many incidences you can recall where **YOU** acted on the instructions of an authority figure that you did not believe was correct?

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Please Indicate (1)	
---------------------	--

4. Please estimate in the past **MONTH** how many incidences you can recall where you observed a **PEER** acting on the instructions of an authority figure that you did not believe was correct?

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Please Indicate (1)	
---------------------	--

5. Please estimate in the past SIX MONTHS how many incidences you can recall where **YOU** acted on the instructions of an authority figure that you did not believe was correct?

0 5 10 15 20 25 30 35 40 45 50

Please Indicate (1)	
---------------------	--

6. Please estimate in the past SIX MONTHS how many incidences you can recall where you observed a **PEER** acting on the instructions of an authority figure that you did not believe was correct?

0 5 10 15 20 25 30 35 40 45 50

Please Indicate (1)	
---------------------	--

Next we will ask you some questions about your experiences with obedience.

1. Have **YOU** ever felt you were in a situation where you could not contradict a person in a position of authority even though you believed the person in the position of authority was incorrect?

Yes (1)

No (2)

2. Have **YOU** ever been subjected to negative consequences because you spoke up when you believed a person in a position of authority was incorrect?

Yes (1)

No (2)

3. Has a **PEER** ever expressed to you that they felt that they could not contradict a person in a position of authority even though they believed the person in the position of authority was incorrect?

Yes (1)

No (2)

4. Have you ever witnessed a **PEER** being subjected to negative consequences because they spoke up when they believed a person in a position of authority was incorrect?

Yes (1)

No (2)

5. Have **YOU** ever experienced any feelings of distress because you acted on the instructions from an authority figure that you did not believe were correct?

Yes (1)

No (2)

Skip To: Q47 If 5. Have YOU ever experienced any feelings of distress because you acted on the instructions from... = No

6. If **YOU** have ever acted on the instructions from an authority figure that you did not believe were correct, how distressed did it make you feel?

	Not at all Distressed (1)	Moderately Distressed (2)	Highly Distressed (3)	Extremely Distressed (4)
Please Indicate (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Have you ever witnessed a **PEER** experience or display distress because they acted on the instructions of an authority figure that **THEY** did not believe were correct?

Yes (1)

No (2)

Skip To: End of Block If 7. Have you ever witnessed a PEER experience or display distress because they acted on the instru... = No

8. If you have witnessed a **PEER** experience or display distress because they acted on the instructions of an authority figure, in your opinion, how distressed did they appear?

	Not at all Distressed (1)	Moderately Distressed (2)	Highly Distressed (3)	Extremely Distressed (4)
Please Indicate (1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

For the final questions about Obedience we will ask you about some of your perceptions of Obedience.

1. Have **YOU** ever acted on what you believed were the incorrect instructions of an authority figure because you were concerned with being perceived as competent?

Yes (1)

No (2)

2. Have **YOU** ever acted on what you believed were the incorrect instructions of an authority figure because you were concerned with how the authority figure may view you professionally?

Yes (1)

No (2)

3. Have **YOU** ever followed the actions of another person, or several other people, who were acting based on the instruction of an authority figure when you were not sure if what they were doing was correct?

Yes (1)

No (2)

4. Have **YOU** ever followed the instructions of an authority figure because you did not believe that you would be held responsible for the outcomes of those actions?

Yes (1)

No (2)

Finally, we would like to give you some space to talk about any experiences, thoughts, or ideas you have about Conformity and Obedience in your education and professional life. You can write about these in the space below.

Please indicate your age

0 10 20 30 40 50 60 70 80 90 100

Please Indicate (1)



Please indicate your biological sex

- Male
- Female
- Other
- Prefer not to indicate

Please indicate your faculty

- Medicine and Dentistry (1)
- Nursing (2)
- Rehabilitation Medicine (3)
- Pharmacy and Pharmaceutical Sciences (4)
- Agricultural, Life & Environmental Sciences (5)
- Kinesiology Sport and Recreation (6)

Please indicate your program area

Please indicate your program year

0 1 2 3 4 5 6 7 8 9 10

Please Indicate (1)	
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APPENDIX B: CHAPTER FOUR**Consent Form**

Study Title: An Examination of the Validity and Utility of Personality Assessment in Simulation Learning

Principal Investigator:

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500 Center for Applied Technology

Northern Alberta Institute of Technology

Edmonton, AB, T5G 2R1

bwitsche@nait.ca

Co-Investigator:

Efrem Violato

6-132 Education Centre North

University of Alberta

Edmonton, AB, T6G 2G5

violato@ualberta.ca

(430) 681-7291

Background:

This project is a part of the ongoing program of research at NAIT into simulation education in conjunction with concurrent research at the University of Alberta. We are asking for your voluntary participation in this study to help us better understand the experiences of Health Professional students when they are engaged in simulation learning. The results of this study will be used by the research team to improve students' educational outcomes in the future, be used for dissertation work, as well as be submitted to academic journals, and conference presentations.

Purpose:

The purpose of this study is to determine the validity of using personality assessment with Health Professional students to assess how different personality types experience simulation scenarios. This research will have the benefit of identifying differences in the way different personality types engage in simulated clinical scenarios and inform future research attempting to make clinical simulations adaptive to individual learners in order to maximize educational outcomes.

Study Procedures:

The first part of this study is the completion of a questionnaire hosted on the website Qualtrics. The questionnaire will consist of some demographic questions as well as personality measures. The personality measures will include a short written response section as well as a few brief personality survey questions. Completing the questionnaire will take approximately 20-30 minutes. The second part of the study will consist of a simulated clinical scenario, after participating in the simulation there will be a brief interview and debriefing. The simulation, interview, and debriefing are expected to take approximately 45 minutes. The total participation time is expected to be 1.25 hours. During the simulation scenario there will be audio and video recording. If you consent to participate you will be directed to the questionnaire. You will first see the written response and survey portion of the questionnaire before completing the demographic information.

Potential Benefits and Risks:

The participants of this study will not receive any compensation for participation. There will be no benefit of participating in this study related to course grades. There will be no other immediate benefit to participation in this study though the information gathered will help to potentially inform and change curriculum and process approaches for simulation learning for

students in the Health Professions. There are no foreseeable risks or costs to participating in this study. Participation is entirely voluntary, in the case participants experience any distress they may end their participation at any time. If you experience any distress and would like to seek support information for counselling services is provided below:

Counselling Services:	mywellnessplan.ca
W111PB - HP Centre	The Distress Line - 780.482.HELP
Phone: 780.378.6133	(4357)
Email: counselling@nait.ca	Adult Crisis Team - 780.342.7777
Monday to Friday	
Until Fri 2 Nov 2018: 8 a.m. - 4:30	
p.m.	
*After Mon 5 Nov 2018: 8:30 a.m.	
- 4 p.m.	

Voluntary Participation:

You are under no obligation to participate in this study. Therefore, participation is completely voluntary. You can opt out without any penalty.

Confidentiality & Anonymity:

The research will be used for a thesis/dissertation, research articles, and conference presentations. Participants will not be identified in any situations. The data will be kept confidential, only the principal investigator and co-investigators will have access to the data.

Anonymity can be guaranteed as no personal identifying information such as names of student IDs will be collected. Participants will be assigned a participant ID number that will be used for communication with the participant. Through all stages of the research data will be deindividuated and questionnaire, audio and video recordings will only be associated with the participants ID number assigned during the study, the ID number will not be associated with any names or other student identification material making the data anonymous. As the data will be anonymous and deindividuated after the study has been completed it will not be possible to remove individual participants data.

Data from the Questionnaire will be kept on a secure account hosted on the website Qualtrics and a secured hard drive. Access to Qualtrics is password protected and encrypted. You should know that while we will keep the information you give us confidential - in the United States under US privacy laws, the government has the right to access all information held in electronic databases. Video and audio recording data will be held on the secured hard drive, this is the only location that the video and audio data will be stored. Video or audio data will not be held in any manner that can be accessed by anyone outside of the Principle and Co-Investigators. The data will be held for a minimum of 5 years following completion of the research project. Data will be destroyed by deletion of the database holding the data on Qualtrics as well as the hard drive.

If participants want, they can receive a copy of a report of the research findings by contacting the principal investigator through the email indicated on this consent form.

Further Information:

If you have any further questions, please do not hesitate to contact the principal investigator Brian Witschen (bwitsche@nait.ca). This research has been reviewed and approved by the NAIT Research Ethics Board. If you have any questions or concerns about ethical matters, you may

contact Dr. Melissa Dobson, Chair of the NAIT Research Ethics Board at REB@nait.ca or 780.378.5185.

The plan for this study has been reviewed by a Research Ethics Board at the University of Alberta. If you have questions about your rights or how research should be conducted, you can call (780) 492-2615. This office is independent of the researchers.

Consent Statement:

I have read this form and the research study has been explained to me. I have been given the opportunity to ask questions and my questions have been answered. By consenting, I have not waived any rights to legal recourse in the event of research-related harm. If I have additional questions, I have been told whom to contact. I agree to participate in the research study described above and will receive a copy of this consent form. I can download a copy of this consent form. By selecting the option *I Agree* in the survey I consent to participate in the study.

Initial Questionnaire

Thank you for your interest in this study, below is a link to a consent form. Please read the consent form, if you choose to participate select I AGREE, if you choose not to participate select I DISAGREE. If you choose I DISAGREE your participation in the study will end.

https://docs.google.com/document/d/1ctJou8A3Llig7q6RE_ot93EwltYghum4PkeTu3tM8pg/edit?usp=sharing

I AGREE

I DISAGREE

Thank you for participating in this study. This is the first of two parts to the study. Today you will be asked to answer some demographic questions, complete a brief writing task, and then complete a personality questionnaire. In the next part of the study you will participate in a simulated clinical scenario and then be asked some questions after the simulation.

The purpose of this study is to understand how different personality types engage in simulated scenarios and to test a new method of personality study.

As you complete the questionnaire today please take the time to **carefully read and complete the questions**. This is essential to obtain valid results.

The information you provide in the next few questions will be used to self-generate your unique participant identifier and will protect your identity and confidentiality. **CAREFULLY answer**

the questions. In the future stages of the study you will be asked these same questions so **it is important that you answer the questions exactly the same way each time you participate.**

-----What is the **FIRST LETTER** of your **MOTHER'S FIRST NAME** (MOTHER means the person you call your mother; she could be your natural or adoptive mother. If you do not know, then choose the letter N)?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

What is the **FIRST LETTER** of your **FATHER'S FIRST NAME** (FATHER means the person you call your father; he could be your natural or adoptive father. If you do not know, then choose the letter N)?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

What is the **FIRST LETTER** of the **HIGH SCHOOL YOU GRADUATED FROM** (if you did not graduate from high school, please select the letter N)?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

What is **YOUR MIDDLE INITIAL** (if you have no middle initial, please select the letter N)?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Does **YOUR FIRST NAME** begin with a letter (select one):

- In the **FIRST HALF** of the alphabet (i.e., **A through M**)?
- In the **SECOND HALF** of the alphabet (i.e., **N through Z**)?

What month were you born?

January

February

March

April

May

June

July

August

September

October

November

December

Q1 Please indicate your biological sex

Male

Female

Other

Q2 Please indicate your age

0 10 20 30 40 50 60 70 80 90 100



Q3 Please estimate your GPA

0 1 2 3 4



Q4 Please select the choice that best represents your ethnicity/geographic background

Caucasian (European Origin)

Hispanic (Latin America)

South East Asian

Chinese

Japanese

Pacific Islander

African Canadian/American

African

India

Middle East Origin

Aboriginal

Other

Prefer not to indicate

Q5 Please estimate the number of times you have practiced in a simulated health care setting or with a simulator

Q19 Please indicate your level of experience with Airway Management from: *1 - Not at all Experienced to 5 - Very Experienced*

	1	2	3	4	5
Experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q20 Please indicate your level of confidence performing Airway Management: *1 - Not at all Confident to 5 - Very Confident*

	1	2	3	4	5
Confidence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Q40 Please estimate the number of hours of experience in the classroom, lab or simulation you have had with Airway Management

0 10 20 30 40 50 60 70 80 90 100



Q6 Please estimate the number of weeks of clinical experience you have had

0 25 50 75 100



Q7 Please indicate your program

Respiratory Therapy

EMT – Paramedic

Q8 Please indicate your program year

0 1 2 3

Program Year	
--------------	--

Q9 Counting all of your years of post-secondary education what year of post-secondary is this for you?

0 2 3 5 6 8 9 11 12 14 15

Year of Post-Secondary	
------------------------	--

For the next part of the questionnaire we will be asking you to complete a writing task. The purpose of the writing task is to provide data that will be used to complete a personality assessment as well as determine the validity of using writing tasks for assessing how different personality types learn in simulation. It has been shown that writing tasks can be used as an alternative and richer form of assessing personality traits by analyzing writing patterns (Kufner, Back, Nestler, & Egoff, 2010). You will be assigned to one of several different writing tasks, some of these tasks will be related to healthcare while others will be unrelated to healthcare. Assignment to the writing task is completely random. (Kufner, A.C.P., Back, M.D., Nestler, S., & Egoff, B. (2010). *Tell me a story and I will tell you who you are. Lens model analyses of personality and creative writing. Journal of Research in Personality, 44, 427-435.*)

Educational Material Task

Often in healthcare we are faced with situations where we are unsure how to act. Sometimes a person who is in a position of authority will ask us, or someone around us, to carry out a procedure that we think is incorrect. For example, a senior physician might ask us to deliver 50mg of a drug but we know this is incorrect and the proper dosage is 25mg, however we do not say anything and carry out the procedure as instructed. There are two parts to the writing task:

First, please take time to write about how **NOT** speaking up when an authority figure acts incorrectly, or recommends action that is incorrect, can have negative outcomes for patients.

Please be detailed and write about different negative outcomes, these may include situations you have experienced. **Second**, please write about a situation where an authority figure is asking you to carry out a task incorrectly and how you would act to ensure the best outcome for a patient.

Please be detailed in describing how you would act. What words or phrases would you use?

What would your body language be? What would you do if the authority figure was not accepting of your initial action?

The more detail you can provide the better an understanding of your personality can be developed.

Neutral Task 1

Writing about events in the past can be helpful in taking a reflective position that is useful in determining different personality traits. For this writing task we would like you to think back to the summer, specifically we would like you to think about the best summer vacation you can remember and write about that summer vacation in as much detail as possible.

The more detail you can provide the better an understanding of your personality can be developed.

Neutral Task 2

Becoming a healthcare professional requires a great deal of commitment and studying. For this writing task there two are parts:

First, in as much detail as possible please write about your favorite place to study. Where is that place? What does it look and smell like? Please feel free to go into as much detail as you like.

Second, please write about your study strategies. How do you like to study? What methods do you use? What time of day do you like to study? Please feel free to go into as much detail as you like.

The more detail you can provide the better an understanding of your personality can be developed.

Neutral Task 3

Writing about favorite events that we enjoy can be helpful in taking a reflective position that is useful in determining different personality traits. For this writing task we would like you to write about your favorite past-time outside of school. What is that activity and why do you enjoy it? Where do you do it? How frequently do you do it? Please feel free to go into as much detail as possible.

The more detail you can provide the better an understanding of your personality can be developed.

Thank you for completing the writing task. After you have completed the simulation you will be asked a few questions and may be asked to complete another brief writing task on a topic that you were NOT assigned to. To maintain the integrity of the personality assessment and your learning in the simulation we ask that you **PLEASE DO NOT DISCUSS** the writing task that you were assigned to with any of your peers participating in this study. Discussing the writing tasks with others can cause the second writing task you complete to not be effective and will not allow for an accurate measure of personality.

There is one more section of the questionnaire for you to complete.

The final section is a personality questionnaire. There are 32 questions. The results from the questionnaire will be used to compare and contrast with the writing task to help interpret the writing task and determine your personality type.

Part 1. When you decide whether something is **Right** or **Wrong**, to what extent are the following considerations relevant to your thinking? Please rate each statement.

--

7. Whether

or not

someone

cared for

someone

weak or

vulnerable

8. Whether

or not

someone

acted

unfairly

9. Whether

or not

someone

did

something

to betray

his or her

group

10.

Whether or

not
someone
conformed
to the
traditions
of society

11.

Whether or

not
someone
did
something
disgusting

12.

Whether or

not
someone
was cruel

13.

Whether or

not
someone

was denied

his or her

rights

14.

Whether or

not

someone

showed a

lack of

loyalty

15.

Whether or

not an

action

caused

chaos or

disorder

16.

Whether or

not

someone

acted in a



way that
God would
approve of

Part 2: Please read the following sentences and indicate your **Agreement** or **Disagreement**

19. I am
proud of my
country's
history

20. Respect
for authority
is something
all children
need to learn

21. People
should not
do things
that are
disgusting,
even if no
one is
harmed

22. It is
better to do
good than to
do bad

23. One of
the worst
things a
person could
do is hurt a
defenseless
animal

24. Justice is
the most
important
requirement
for a society

25. People
should be
loyal to their
family
members,
even when
they have
done
something
wrong

26. Men and women each have different roles to play in society

27. I would call some acts wrong on the grounds that they are unnatural

28. It can never be right to kill a human being

29. I think
it's morally
wrong that
rich children
inherit a lot
of money
while poor
children
inherit
nothing

30. It is
more
important to
be a team
player than
to express
oneself

31. If I were
a soldier and
disagreed
with my
commanding
officer's
orders, I
would obey
anyway
because that
is my duty

32. Chastity
is an
important
and valuable
virtue

APPENDIX C: CHAPTER FOUR

Compliance Simulation Procedures: for Facilitators

Context:

At the point of participating in the simulation the participants will have filled out a questionnaire that included demographic questions, a writing task and a personality questionnaire. This occurred approximately a week prior to the simulation.

The participants are under the impression that the study is a personality study. The participants believe that the writing task was a personality assessment that will be related to their performance in the simulation. The true purpose of the writing task is to help participants engage in positive deviance (treatment condition).

For the simulation portion of the study participants will be exposed to a high or low cognitive load scenario where an anesthetist is attempting to secure a patient's airway. The primary variable of interest is if the participant engages in positive deviance. The participant will have two opportunities to speak up, if they engage in positive deviance twice the scenario will end.

Positive Deviance: When a person speaks up or engages in action that is counter to the incorrect instructions or actions of a person in a position of authority; for example, in the present simulation scenario if the participant tells the physician that what they are doing is incorrect or that they should stop this would count as positive deviance.

Procedures:

Facilitator should remain in the sim area separate from the participants for the entirety of the simulation session.

1. Have personal device ready and loaded to the questionnaire start page
2. Call a participant from the waiting room to the simulation room.

3. Give the participant the device and have the participant complete the ID and deception check question.
4. Retrieve the device from the participant when they are finished.
5. Enter the simulation room.
6. A participant ID will be presented to you. Communicate this to the Sim Facilitator.
7. High or Low cognitive load will be presented to you on the questionnaire, select the option presented, indicate to the actors which scenario (high or low cognitive load will occur).
8. Ensure actors are prepared. Return to the participant.
9. Tell the participant they may enter the simulation
10. Observe the simulation.
11. When the point for positive deviance arises if the participant is positively deviant select the appropriate option in the questionnaire.
12. After the simulation is terminated take the participant to the debriefing room.
13. Activate audio recording
14. State aloud the Participant ID presented to you.
15. Proceed through the remainder of the questions on the questionnaire.
16. After completing the questions complete the debriefing, including the deception check.
17. Answer the question for the deception check.
18. Thank the participant for participating and dismiss them, reminding the participant not to discuss the true nature of the study with anyone.
19. Complete the survey and refresh the survey on the device (will have to delete browser history) and repeat 1-16.

Simulation Procedures

School of Health and Life Sciences

Simulation Centre

Compliance Behaviour During an Airway Emergency

Creation Date: February 2019

Public Scenario Title

Compliance Behaviour During an Airway Emergency

Scenario Description

In an urban emergency department an Anesthesiologist has had two intubation attempts without success. The RT and/or ACP is called in by the charge nurse to assist with capturing the airway and as they enter the room the anesthetist begins to attempt intubation for the third time.

There are two different groups of students for this simulation research project, a high cognitive load group and a low cognitive load group.

For the high cognitive load group there will also be a standardized patient playing the role of a distraught family member who is asking lots of questions and saying things like “help my husband”.

Scenario Objectives

1. Ensure closed-loop communication between team members
2. Use NOD (name, occupation, duty) when first introducing self to patients and family members
3. Rapid Patient Assessment
4. Appropriately challenging inappropriate decision making

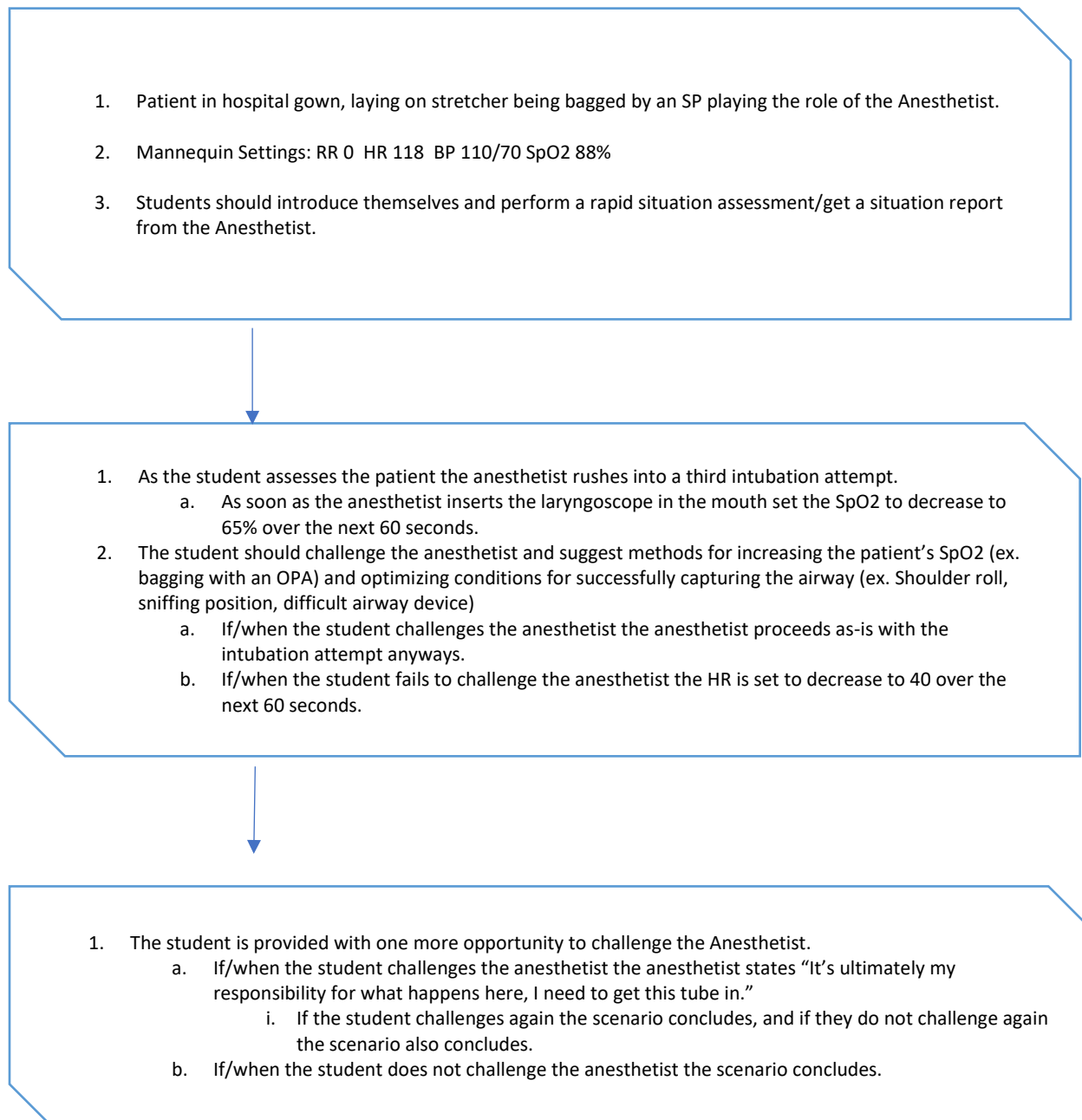
Equipment and Supplies

Mannequin laying on bed, wearing hospital gown.	Sim cart
OPA's	Suction set up with yankeur suction attached
Intubation Tray	Bougie Stylette
Bagger and mask	

Scenario Flow

Briefly describe progressive scenes (aka states or stages)

1st Scenario:



Briefing (or Prebriefing) Information

Participant(s) in the Hot Seat

You are working a shift at the UofA emergency department and have just returned from Lunch break when the charge nurse rushes over to you and says “we need you right away in room one, I think Dr. Anderson from Anesthesia is having trouble getting an airway on a sepsis patient that just arrived.

Standardized Patient Information

One standardized patient will play the role of an anesthetist.

The SP should be a Caucasian male between the age of 40 and 55, and of medium build (i.e. taller than 5’7 but shorter than 6’ if possible

The SP will have an earpiece mic so that the simulation facilitator can help guide their actions.

When the scenario begins the SP will be in the simulation room with intubation equipment open/used at the bedside. They will be ventilating the patient with a bagger and looking somewhat stressed out.

When the student enters the room and introduces themselves the SP will say in a rushed/hurried manner “I’m Dr. Anderson from anesthesia, I’m just about to give this intubation another try here.”

The SP will then begin to attempt intubation on the mannequin.

Further dialogue and actions will be guided through the earpiece by the simulation facilitator.

****High Cognitive Load Group Only (half of the students)** A second SP will play the role of the patient's wife.**

This SP should be female between the age of 40 and 55. They will be at the patient's bedside and be nervous/worried/distraught. Once the student enters the room and has an initial dialogue with the anesthetist the SP begins saying:

“What is going on?”

“Should all of those alarms be ringing?”

“What are you doing?”

“What do all those numbers mean?”

Further actions and dialogue will be guided by the simulation facilitator through an earpiece mic.

Debriefing Information

Debriefing will be performed as per the debrief protocol submitted to the NAIT research ethics board.

Roles of the Facilitator through the Simulation Experience

- Respect for learner opinions and psychological safety
- Belief in integrity of learning through simulation
- Manages upset/monopolizing/outlier individuals

APPENDIX D: CHAPTER FOUR

Simulation Questionnaire and Facilitator Rating and Instructions

Thank you for participating in the second part of this study.

First we will ask you to fill out some questions so that we can link the simulation with the previous questions you completed.

Please fill the questions out carefully.

What is the **FIRST LETTER** of your **MOTHER'S FIRST NAME** (MOTHER means the person you call your mother; she could be your natural or adoptive mother. If you do not know, then choose the letter N)?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

What is the **FIRST LETTER** of your **FATHER'S FIRST NAME** (FATHER means the person you call your father; he could be your natural or adoptive father. If you do not know, then choose the letter N)?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

What is the **FIRST LETTER** of the **HIGH SCHOOL YOU GRADUATED FROM** (if you did not graduate from high school, please select the letter N)?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

What is **YOUR MIDDLE INITIAL** (if you have no middle initial, please select the letter N)?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Does **YOUR FIRST NAME** begin with a letter (select one):

- In the *FIRST HALF* of the alphabet (i.e., **A through M**)?
- In the *SECOND HALF* of the alphabet (I.e., **N through Z**)?

What month were you born?

January

February

March

April

May

June

July

August

September

October

November

December

If you recognize any of the following names please select that name.

Kufner

Cronbach

Haidt

Zimbardo

Maslow

Asch

Rogers

Milgram

None of the Above

Thank you for completing the questions. Please return the device to the facilitator.

Thank you for completing the questions. Please return the device to the facilitator.

For Facilitator

1. This is the participants Random ID. Please communicate this number to the Simulation

Facilitator: **Random ID**

2. **Please select the option that appears.** This will be the condition for the participant. Please inform Actors

High Cognitive Load

Low Cognitive Load

How many times did the participant challenge the Physician?

Never

Once

Twice

Three Times

At what points did the participant challenge the Physician?

- When Physician Attempts Intubation
 - After Physician Ignores Participant
 - When SpO2 and HR Decrease
 - After Physician States: "I need to do this"
 - After Physician States: "It is my responsibility"
-

Please Ensure Audio Recording is Activated

This is the participants Random ID. Please communicate it to the Simulation Facilitator and state it aloud when audio recording has begun.

Random ID

Debriefing: Please read the following text to participants.

1. What is the First Letter of your Mothers First Name? (if you don't know say N)
2. What is the First Letter of your Fathers First Name? (if you don't know say N)
3. What is the First Letter of the High School you graduated from (if you don't know say N)

4. What is your Middle Initial (if you don't have a middle name say N)
5. Does your first name begin with a letter in the First Half of the alphabet (A-M) or the Second Half of the Alphabet (N-Z)
6. What month were you born?

Follow Up Questions (see Appendix E)

Debriefing Script (see Appendix E)

Did the Participant Guess the True Purpose of the Study?

Yes

No

Notes on the extent that the participant guessed it? How? Why? Etc.

APPENDIX E: CHAPTER FIVE**Follow Up**

Before we finish up today, I would like to ask you a few questions about the simulation. As you know I was watching during the simulation and there are a few follow up questions I have, these questions will not be technical regarding the procedure but will be more about what you thought and how you felt during the simulation. Does this sound ok to you?

Initial Questions'

1. Can you tell me why you *did/or did not* say anything to the Anesthetist when he was attempting to secure the airway?
2. Do you think your peers would have acted in the same way that you did?

The next set of questions I have are about the ways that you thought you might be perceived by the doctor or myself.

Question Set 1:

1. At any time before or during the simulation were you concerned with how the *doctor (or family member if High Cog Load)* might view you professionally?
 - a) Were you concerned with how they might view you personally?
2. Were you at all concerned with how I may have viewed you professionally?
 - b) Were you concerned how I might view you personally?
3. Do you think how you acted in the simulation was at all related to how myself or anyone else might view you?
4. At any time before or during the simulation were you concerned with being perceived as competent? Being competent could relate to the procedure being performed, yourself as a health care professional, or yourself in general.

5. Were you at all concerned about your own self-perception and how you might view yourself during or after the simulation?

Question Set 2:

The final set of questions I have are about the ways that you felt during the simulation and if you experienced any negative feelings.

1. At any time during the simulation did you feel any distress and if so at what point and why?

a) How distressed did this make you feel?

b) Did you have any other emotions?

2. Did you feel any personal (**self**) conflict when you were observing the anesthetist carrying out the procedure?

3. As you watched the anesthetist what was the internal dialogue in your head? What were you thinking to yourself?

a) What were you thinking when you spoke up and he was not receptive (**If applicable**)

4. I know this was only a simulation, but did you feel like you had a sense of moral duty or responsibility to the patient? Why or why not?

(If participant says no prompt with: did you have any feeling about doing the right or wrong thing?)

5. During the simulation, at any point, were you concerned at all about who may bear responsibility for the outcomes of the procedure? Can you please explain?

Thank you very much for taking the time to answer these questions. This is the end of the study,

I will now go over a debriefing with you.

Debriefing Script

(Provide participants with a copy after presenting orally)

- Now that the study has concluded I would like to inform you about the true nature of the study and the simulation.
 - The purpose of the study was to examine if participants will engage in Positive Deviance towards an authority figure. Positive Deviance is speaking up or not following the instructions of an authority when you believe that what is happening is incorrect, unsafe, or not ethical.
 - Research in psychology has shown that people tend to listen to an authority figure and not speak up, even when the person believes what is happening is wrong.
 - In this simulation we wanted to understand how different variables, including personality characteristics, cognitive load and education might influence positive deviance.
 - We were interested in when you observed the anesthetist performing the procedure incorrectly you would speak up. It has been shown that in similar situations 65-80% of people will not speak up or will follow the authority's instructions. If you engaged in positive deviance or not your behaviour was entirely normal.
 - To evoke a naturalistic response and understand how people behave in compliance scenarios it was not possible to inform you about the true nature of the study beforehand.
 - Part of the experiment was to develop new educational material to improve the rate of positive deviance, this was done through the writing task. There were two conditions for the writing task, a neutral condition and treatment condition. If you were in the treatment condition you were asked to write about the potential negative outcomes of being obedient when you believe something is wrong and how you would act in a positive

manner. The purpose of this writing task is to help people identify as a person that would engage in positive deviance.

- At this time, I would like to ask if you are experiencing any discomfort about your performance during the simulation or the study? (If so direct participants to the listed resources below).
- I would also like to ask if you had any idea about the true nature of the study at any point during your participation? If so, please explain.
- One of the benefits of participating in this study for participants is that you now have new knowledge about authority and that if you see something wrong or believe something is incorrect this experience will help you to feel confident in your ability to speak up should a similar event happen in your professional practice.

The biggest benefit is that with your new knowledge you can have a positive impact on the safety of patients.

- At this time, I would like to review the proper way to carry out the procedure (review with participants).
- If you have any questions about the technical aspects of the procedure, I can answer these or direct you towards an instructor that can address your questions.
- Do you have any questions regarding the experiment? (If debriefer is unable to answer the question direct the participant to the Principle Investigator or Co-Investigators). You may contact the researchers if you have any questions in the future, the researchers contact information is below.
- At this time, I would like to reaffirm your consent to participating and having your data be a part of the study. Everything will be kept entirely confidential.

- **Finally, I would like to ask that you, as an ally in this research, do not discuss the true nature of this simulation with any of your classmates or peers. This is essential in order to maintain the reality of the simulation and to obtain natural reactions for participants. Even more so it is important in order to continue this research for improving patient safety and student learning.**
- Thank you very much for your participation in this study, it has been very helpful. If you would like to obtain the results of the study or have questions in the future, you may contact: *Efrem Violato* violato@ualberta.ca

On Campus Resources for Mental Wellness

Counselling Services:

W111PB - HP Centre

Phone: 780.378.6133

mywellnessplan.ca

Email: counselling@nait.ca

The Distress Line - 780.482.HELP (4357)

Monday to Friday

Adult Crisis Team - 780.342.7777

Until Fri 2 Nov 2018: 8 a.m. - 4:30 p.m.

*After Mon 5 Nov 2018: 8:30 a.m. - 4 p.m.