A Multimodal Approach to Understanding Concealable Stigma Disclosure Across Social Contexts

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

DOCTOR OF PHILOSOPHY

By

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Table of Contents

Statement of Candidate

I certify that the work in this thesis titled "A Multimodal Approach to Understanding Concealable Stigma Disclosure Across Social Contexts" is my own work. As this thesis is submitted as a Thesis by Publication, all contributions and assistance by my collaborators and co-authors are appropriately acknowledged within this document.

I acknowledge that a subset of the data reported in paper II (*Chapter 3: Embodiment of concealable stigma disclosure through dynamics of movement and language*) were submitted in partial fulfillment for the degree of Master of Arts at the University of Cincinnati in 2016. These data include the postural time series analysis only. Furthermore, data were reanalysed and results of the postural activity at the head and the waist were averaged here for ease of interpretation. I certify that no other data reported in paper II—and in the three other manuscripts—have been submitted for a degree to any other institution.

The research presented in this thesis was approved by the Macquarie University Human Research Ethics Committee, Human Ethics Approval: 5201954049162 – June 2019 and the University of Cincinnati Institutional Review Board Approval: 2014-0624 – June 2014.

Hannah M. Douglas
10 February, 2020

List of Tables

List of Figures

List of Abbreviations

AP	Approach
AV	Avoidance
B	Boss
C	Colleague
CO	Close other
CSI	Concealable stigmatized identity
DFA	Detrended fluctuation analysis
DPM	Disclosure processes model
E	Exotic dancer
F	Family
FT	Former teacher
FR	Friend
EA	Emotional abuse
ED	Eating disorder
GSM	Gender and sexual minority
M	Mentor
MHD	Mental health disorder
NLP	Natural language processing
pMaxline	Proportional maxline
P	Professor
PO	Professional other
PSR	Phase space reconstruction
RM	Roommate
RP	Recurrence plot
RQA	Recurrence quantification analysis
%REC	Percent recurrence
SA	Sexual assault experience
SEANCE	Sentiment Analysis and Social Cognition Engine
SI	Self-injury
SO	Significant other
SP	Sport coach

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Finally, I would like to dedicate this thesis to all who participated in this research. Thank you for your openness and vulnerability. I hope this writing does your voices justice.

Abstract

Disclosing a concealable stigmatized identity (CSI)—such as a mental health disorder or sexual assault—is a complex process whereby the risk of discrimination is weighed against the burden of concealing. However, little is known how individuals communicate stigma across behavioural modalities, such as language and nonverbal movement dynamics, and situational contexts. This thesis connects four manuscripts that examine the information provided during disclosure. Chapters 2 and 3 drew from one study in which participants simulated a CSI disclosure to close other and professional other confidants, and were primed with approach-avoidance motivation. In chapter 2, a thematic analysis of transcribed disclosures revealed that participants not only shared *CSI related information*, but also identified their *reasons for disclosure/concealment*, *anticipated response of the confidant*, and *post-disclosure goal*s for the relationship. Results also suggested that participants were more likely to disclose to a professional other in order to shift the relationship from professional to more intimate while participants disclosed to close others in order to mend the existing relationship. Chapter 3 extended this work by examining the ways in which disclosure motivation and context are reflected in unintentional behavioural dynamics. Results demonstrated that the movement dynamics of participants who were motivated by approach goals exhibited more complex and flexible behaviour compared to those motivated by avoidance goals. In addition, there was more recurrent word use towards close others compared to professional others. Chapter 4 is a response to the previously described work as it investigated the impact of concealable stigma disclosure on interpersonal coordination and affiliation. Participants who viewed a confederate's bisexual disclosure (compared to depression and neutral disclosures) exhibited less turn taking in a collision avoidance walking task. In study two of this chapter, affiliation increased following coordinated action, however, this was not correlated with degree of synchrony. Finally, Chapter 5 scaled up to the systemic level by examining a corpus of

20,397 tweets from the online movement, #WhyiDidntReport which emerged to highlight the varied reasons for concealing a sexual violence experience. Content analysis of a sample of 500 tweets containing that tag identified five overarching barriers to disclosure including: *Intrinsic reasons for nondisclosure* (e.g., shame), *fear of disclosure outcomes*, *negative disclosure history*, *systemic barriers* (e.g., perpetrator held a position of power), and *information regarding the experience itself* (e.g., age of victimization). Natural language processing results found that sentiment relating to power was most represented. Furthermore, network analysis of tweet sentiment revealed the underlying motivation in participation in online activism including relief and physical well-being. As a whole, this work described the ways in which individuals with a CSI share their identities and the interpersonal coordination following a disclosure event—both aspects of the disclosure process relatively understudied. The results across the body of this thesis provide crucial information regarding the strategies used to share a CSI in different contexts, and the individual and systemic level barriers to disclosure of sexual violence. Ethical considerations of these methodologies and practical implications are discussed within each chapter and in the final chapter of this thesis.

Thesis by Publication and Collaborator Contributions

This thesis has been prepared in the 'Thesis by Publication' format. As such, chapters 2, 3, 4, and 5 have been written and presented as independent publications. Given this, there is some theoretical overlap and repetition of cited literature across these chapters. Collaborator and author contributions can be found in the table below.

Hannah M. Douglas (HD), Anthony M. Foster (AF), Erin B. O'Callaghan (EO), Rachel W. Kallen (RK), Michael J. Richardson (MR), Stacie Furst-Holloway (SFH), Stephanie R. Chaudoir (SC), Sarah Toohey (ST), Brian A. Eiler (BE)

	Paper I	**Paper II**	**Paper III**	**Paper IV**
Theoretical Contribution	HD, AF, EO, RK, SC	HD, RK, MR, SFH, SC	HD, RK, MR, ST	HD, BE, RK
Location and year of data collection	University of Cincinnati 2015-2016	University of Cincinnati 2015-2016	Macquarie University 2019-2020	Macquarie University 2018
Data collection	HD, AF	HD, AF	HD, ST	HD, BE
Analysis & interpretation	HD, AF, EO *Thematic Analysis*	HD, MR, RK *DFA and RQA of movement and language data*	HD, MR, RK *Cross-spectral coherence & Circular deviation of movement data*	HD, BE *Content analysis & language network analysis of #WhyIDidntReport tweets*
Manuscript preparation and review[i]	HD, AF, EO, RK, SC	HD, RK, MR, SFH, SC	HD, RK, MR, ST	HD, BE, RK
Submitted Journal	*Journal of Applied Social Psychology*	*Nature Scientific Reports*	*Cognitive Science Society 2020 Conference Proceedings*	*Violence Against Women*

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[i] I acknowledge that I (HD) prepared the first draft of each manuscript. Further, I was responsible for reviewing and collating all subsequent edits from the listed contributors.

Chapter 1

Introduction

"The self, then, as a performed character, is not an organic thing that has a specific location, whose fundamental fate is to be born, to mature, and to die; it is a dramatic effect arising diffusely from a scene that is presented, and the characteristic issue, the crucial concern, is whether it will be credited or discredited." (Goffman, 1959, p. 245)

Chapter 1: Introduction

The experience of feeling 'discredited' or 'marked' as the result of a perceived physical or moral blemish, whether visible or not, is a ubiquitous phenomenon. For many decades, researchers have attempted to explain the function and outcomes of social stigmatization, that is, any attribute that may be socially discrediting, leaving the bearer uncertain of their position amongst those Erving Goffman termed, 'normals' (1963). While the wealth of research examining stigmatization has provided a deeper and more nuanced understanding of this experience following Goffman's seminal work, *Stigma: Notes on the Management of Spoiled Identity* (1963), the central tenet—that stigmatization is context and relationship specific—has remained steadfast. Though the multitude of identities that carry the weight of stigmatization vary greatly across social situations and fluctuate with time, any identity that could be socially devaluing may influence social and professional relationships (Chaudoir & Fisher, 2010; Jones et al., 1984; Weisz, Quinn, & Williams, 2016). As such, those who bear a stigma that is not readily apparent, or can be hidden from others, often face decisions for when, how, why, and to whom they disclose their concealable stigmatized identity (CSI; Quinn, 2006). This thesis took a holistic approach to the disclosure process by examining the full disclosure event through multiple methodologies and modes of behaviour—such as the qualitative content of a CSI disclosure, embodied movement behaviours, and semantic language networks. This thesis provides a clearer understand of how people living with a hidden stigma share their identities to close friends and family, in professional settings, and through online hashtag movements.

While a disclosure is generally characterised as a singular, interpersonal occurrence, people living with a CSI must reconcile the decision to share their identity throughout their lives. As an example, someone may feel comfortable discussing their bipolar disorder with family members and close friends but take calculated steps to hide their diagnosis in the workplace due to fear of being labelled as unpredictable, or even unsafe (Michalak et al., 2011). As such, this person might adjust their behaviour across these social contexts leading to a

Chapter 1: Introduction

disconnect between their degree of 'outness' within their different life domains (Ragins, 2008).

Despite the complex, evolving nature of the disclosure process, the majority of the existing quantitative research relies on self-reported, cross-sectional data to explore the health and psychological outcomes of disclosure (for example, Quinn, Weisz, & Lawner, 2017; Stutterheim et al., 2011) while qualitative research generally involves memory recall of previous disclosure experiences during guided interviews (for example, Bry, Mustanski, Garofalo, & Burns, 2017; Rosenrot & Lewis, 2018). However, with the growing use of experience sampling methods and relatively easy access to naturalistic data from on-line communities, there are notable advances towards elucidating what happens during or immediately following a disclosure event, and how it unfolds over time (see Andalibi, Haimson, Choudhury, & Forte, 2016; King, Mohr, Peddie, Jones, & Kendra, 2017; Legate, Ryan, & Rogge, 2017; and as notable examples). This thesis contributes to the knowledge of *how* people disclose a CSI through novel simulated disclosure methods (papers I and II), how a confidant responds to a spontaneous CSI disclosure (paper III), and the self-reported barriers to disclosure of sexual violence and structured language networks in on-line hashtag movements (paper IV).

A Brief History of Stigma and Terminology

Any attribute and identity that is socially discrediting or deviates from the societal standards can result in stigmatization (Goffman, 1963; Jones et al., 1984) and "serves to disqualify the stigmatized person from full membership in a society, and cuts him or her off from normal social contact" (Crandall, 2000). Importantly, a social stigma emerges from the interaction between specific characteristics deemed different or deviant based on the context-specific social norms (Bos, Pryor, Reeder, & Stutterheim, 2013; Dovidio, Major & Crocker, 2000). Therefore, rejection and discrimination that occurs as the result of stigma not only impacts day-to-day interactions but is embedded within social institutions which further

perpetuates the devaluation of a given attribute or identity (Frable, Platt & Hoey, 1998). As such, social stigma is a complex phenomenon whereby attributes that are considered devaluing vary greatly across relational and situational contexts (Jones et. al., 1984). For example, a pregnant woman will often experience support from friends and family and even be celebrated in fulfilling the traditional gender role of motherhood. However, as stereotypes associated with pregnancy are made particularly salient in the workplace (e.g., unpredictable emotions and reduced competence), pregnant individuals often experience discrimination and stigmatization unique to the workplace context which can influence leaving decisions (Halpert, Wilson, & Hickman, 1993; Fox & Quinn, 2015). Therefore, in the workplace context, she may be seen as neglecting her work roles and, therefore, choose to intentionally conceal a pregnancy from co-workers and managers until the pregnancy becomes physically apparent (Jones et al., 2016).

Given the complexity of social stigma, researchers have sought to organise the process and characteristics of stigmatization. Goffman (1963) identified stigmatized individuals as *discredited* and *discreditable*. The former being those who have a visible or known stigma such as race or a physical disability, while the latter has an attribute that may be stigmatizing if revealed (i.e., a CSI). He also termed those who do not deviate from social mores as the *normal.* In fact, in his work he identified himself and the reader as 'normal' in saying, "We and those who do not depart negatively from the particular expectations at issue I shall call the *normal.* The attitudes we normals have towards a person with a stigma, and the actions we take in regard to him, are well known" (p. 15). In doing so, Goffman perpetuated the notion that someone with a stigmatized identity is an 'other' whereas the general population is 'normal.' As such, those living with a social stigma are 'less than' compared to the societal norm and creates the challenge for those living with a CSI, as disclosing their identity distances them from the normal. Twenty years following this work, Jones and colleagues (1984) proposed more neutral language in describing the process of stigmatization to avoid the dramatic effect of Goffman's

terminology, though the general structure was maintained. They suggested that someone with a visible stigma is *marked* while those with a hidden stigma are *markable*. As their work described stigmatization within relationships, they identified Goffman's normal as the *marker*.

With the foundation provided by early work in sociology and social psychology, research on stigma processes and outcomes have persisted in being fruitful areas of theoretical and empirical inquiry. The language of the marked has evolved to represent the socio-contextual nature of stigma through a target-perceiver framework. Most recently, stigma researchers have proposed a shift to refer to a stigmatized individual as the 'target' and their co-actor as the 'perceiver'. This language persists today with the target being the bearer of a social stigma and the perceiver serving the role of the 'marked' or 'normal,' though the perceiver may also possess a stigma as well (Dovidio et al., 2000). Crucially, each of these three definitional frameworks highlight the importance of stigma as a situated, relational, and context specific phenomenon. There cannot exist the marked or the target of stigma without the marker or perceiver. Someone cannot be discreditable or markable without the fear of prejudice or stigmatization if their identity is known. Therefore, as suggested by Jones and colleagues (1984), this thesis does not subscribe to rigid terminology when discussing the target and perceiver, the marked and the marker, or the discredited and the normal. Rather, it uses language appropriate to the empirical context. As such, this thesis employs the target-perceiver language suggested by Dovidio and colleagues (2000) while also 'confidant' in place of perceiver, and 'individual with a CSI' in place of the target.

As identities and attributes that are stigmatizing vary widely across time and place, researchers have made extensive efforts to characterise and categorise the important attributes between different stigmas (see Dovidio et al., 2000; Goffman, 1963; Jones et al., 1984 for review). Concealability is one dimension of stigma that has consistently emerged as a crucial component to the process of stigmatization (Jones et al., 1984). Concealability refers to the

degree to which a potentially stigmatizing attribute is immediately visible to the perceiver (Crocker et al., 1998; Dovidio et al., 2000). In contrast to visible stigmas such as race and some physical disabilities, a CSI is not readily available to the perceiver and may allow the target to 'pass' by keeping their identity hidden (Quinn & Chaudoir, 2009). Prevalent examples of concealable stigmas in the literature, that also reflect cultural norms, include mental illness (Corrigan, 2000), gender and sexual minority (Herek & Capitanio, 1996), sexual violence experience (Kennedy & Prock, 2018), living with HIV/AIDS (Earnshaw & Chaudoir, 2009), injecting drug use (Tindal, Cook, & Foster, 2010), sex work (Lazarus et al., 2012), and, in some cases, race (Ragins, 2008). Though not exhaustive, this list represents the diverse array of concealable attributes that are stigmatizing and vary in the controllability and course of the identity.

Despite often being spared immediate social rejection when living with a CSI compared to a visible stigma, those with an invisible stigma often suffer costs of concealing. For example, research has noted lower physical well-being and increased disease progression (Cole, Kemeny, Taylor, & Visscher, 1996; Cole, Kemeny, Taylor, Visscher, & Fahey, 1996), feelings of inauthenticity (Newheiser & Barreto, 2014), and increased cognitive and emotional burden associated with actively managing a CSI (Smart & Wegner, 1999). Furthermore, through the course of some stigmas, the concealability of a CSI is not necessarily fixed (Jones et al., 1984). For example, many people with epilepsy hide their diagnosis, yet often fear an unexpected epileptic seizure resulting in their diagnosis becoming known (Quinn, 2006; Jacoby, 2002). Therefore, while those with a CSI are generally protected from the negative impact of stigmatization upon first meeting, individuals with a hidden stigma will likely have to make the decision when and how to disclose their identity to avoid being unintentionally 'found out' (Brener, Callander, Slavin, & de Wit, 2013). Finally, disclosure has been found to increase

rapport and trust in a relationship (Capell, Tzafrir, & Dolan, 2016), or reduce the burden of concealment (Smart & Wegner, 1999).

Another dimension of significance with regards to stigma management is the perceived *origin* (Jones et. al., 1984) and *controllability* (Crocker et al., 1998) of the mark. When the perceiver attributes blame or personal responsibility to the target for obtaining or having a stigmatized identity, they generally like the person less compared to those with an uncontrollable stigma (Crandall, 2000; King, 2001). Though the degree to which a stigma is controllable at the onset (origination of the stigma) and the offset (removing the stigma) differs in their actuality and perception (Major, Dovidio, Link, & Calabrese, 2018). The attribution of blame can impact hiring decisions (Lyons, Volpone, Wessel, & Alonso, 2017) and healthcare outcomes (Penner, Phelan, Earnshaw, Albrecht, & Dovidio, 2018). For example, patients with lung cancer report higher levels of guilt and shame compared to patients with breast and prostate cancer (LoConte, Else-Quest, Eickhoff, Hyde, & Schiller, 2008). Furthermore, negative patient-provider communication for those with lung cancer is associated with greater feelings of stigmatization in a health care setting (Shen, Hamann, Thomas, & Ostroff, 2016). Considering the variability in degree of concealability over time for many CSIs, and the uncertainty of perceiver response or stigmatization, decisions regarding how and when to unmask a hidden stigma can be difficult to reconcile (Chaudoir & Fisher, 2010).

Concealable Stigma Disclosure and Life Domains

Self-disclosure, defined as interpersonal—generally dyadic—communication of personal thoughts and feelings (Greene, Derlega, Mathews, 2006; Jourard, 1971) is considered a healthy and crucial aspect of developing intimate relationships and coping with trauma (Berg & Derlega, 1987; Frisina, Borod, & Lepore, 2004; Kreiner & Levi-Belz, 2019). Indeed, suppressing negative emotions from others can be deleterious to physical and psychological health (Coates & Winston, 1987; Petrie, Booth, & Pennebaker, 1998). The association between

negative thought suppression and poor health is, in fact, an ancient concept. In ancient Rome, physicians believed that people with a general tendency to suppress their negative emotions were more prone to cancer compared to those who were open (Coates & Winston, 1987; Cooper, 1984).

While people living with a CSI do not need to directly fear a cancer diagnosis as the result of active concealment, keeping a stigma hidden has been linked to negative outcomes such as reduced feelings of belonging (Newheiser & Barreto, 2014), accelerated HIV progression for gay men who conceal their sexual identity (Cole et al., 1996), and increased risk of PTSD symptoms and suicide attempts for women who experienced intimate partner violence (Coker et al., 2002). As such, those with a CSI must weigh the risk of prejudice and discrimination as the result of disclosure against the negative psychological and physical health outcomes associated with concealing.

These decisions are made all the more complex when considering the interpersonal nature of self-disclosure and the uncertainty of the perceiver's (i.e., disclosure confidant's) response to the stigma revelation. While self-disclosure is a natural aspect of forming close relationships (Derlega & Berg, 1987; Sprecher & Hendrick, 2004), revealing too much intimate information too soon can be seen as inappropriate and disconcerting (Chaikin & Derlega, 1974) and can potentially end the relationship prematurely. However, the same disclosure too late in the relationship may cause the target to be viewed as dishonest and erode trust (Lingsom, 2008). As such, the evolving, often reciprocal process of self-disclosure is dynamic across time, and varies as a function of relationship context (Willems, Finkenaur, & Kerkhof, 2019). For that reason, the decision to disclose a CSI such as a mental health disorder, gender or sexual minority, or sexual assault experience often arises throughout the course of social and professional relationships (see Chaudoir & Fisher, 2010; Jones & King, 2014; Quinn & Chaudoir, 2009 for review).

Chapter 1: Introduction

Considering that stigmatization is context dependent, and relationships with others are often constrained by the existing situational norms (i.e., familial, friend, and professional norms), CSI disclosure manifests and serves different functions across life domains. In fact, Jones and colleagues (1984) stated, "It is generally understood that the stigmatizing process is relational. That is, a condition labelled as discrediting or deviant by one person may be viewed as a benign or charming eccentricity by another" (p. 5). As such, the disclosure process including antecedent goals, the event itself, and outcomes will fluctuate depending on the context. For example, a person with a CSI can choose to reveal their identity with family and friends (Frey, Fulginiti, Lezine, & 2018), with health care workers (Benoit et al., 2019), in intimate relationships (O'Callaghan, Lorenz, Ullman, & Kirkner, 2018), in a professional context (Lyons, Zatzick, Thompson, & Bushe, 2017), and anonymously within online communities (Andalibi, Haimson, Choudhury, & Forte, 2018).

Most commonly, research in social psychology have focused on disclosure within close relationships as individuals tend to seek more emotional support and intimacy within these contexts compared to a professional setting (Toth & Dewa, 2014). However, it is important to acknowledge the importance of identity management and social support in workplace settings considering the amount of time spent with colleagues, and the often-blurred line between professional and personal relationships (Lynch & Rodell, 2018). In a qualitative analysis of the impact of sexual assault disclosure on close relationships, Ahrens and Aldana (2012) found that, when these relationships already had a strong foundation, the relationship generally improved following a disclosure. Furthermore, researchers point to the protective function of selective disclosure on social support and stigmatization (Bos, Kanner, Muris, Janssen, & Mayer, 2009) and overall well-being (Legate et al., 2017). Specifically, Legate and colleagues (2017) found that participants who varied in the degree to which they disclosed a lesbian, gay, or bisexual identity during a two-week time period reported higher overall well-being, and

experienced fewer physical symptoms. This suggests that selective disclosure may be an adaptive strategy protecting against the harms of stigmatization (Legate et al., 2017).

Conversely, Ragins's (2008) proposed that differences in disclosure levels across life domains can lead to 'disclosure disconnects' which refers to the identity management strategies necessary to maintain differing levels of visibility between life domains. She suggested that this difference in the degree to which someone discloses a CSI across work and non-work contexts may lead to psychological distress. As such, considerable effort has gone into understanding disclosure in the workplace setting (Clair, Beatty, & MacLean, 2005; Flett, 2012; Jones & King, 2014). Recent work by King and colleagues (2017) using experience sampling methods found that, within participants, gender and sexual minority individuals used different identity management strategies as a function of the people they were interacting with. This lends support to the idea that disclosure disconnects are not necessarily deleterious but may indeed be a healthy and adaptive aspect of identity management.

Though evidence does suggest that concealable stigma targets should employ deliberate disclosure strategies, particularly in the workplace domain, the breadth of existing research highlights the overall positive effect of CSI disclosure in a professional setting. Just as anticipated support and received support are crucial to close other disclosure decisions and outcomes, organisational support serves an important role in workplace identity management (Lyons et al, 2017). Indeed, Wessel (2017) found that organisational policies and perceived organisational support were the strongest predictors of sexual identity disclosure in the workplace. This has important implications, as researchers suggest that hiding a CSI may lead to a less cohesive workgroup, and even result in the target appearing aloof or anti-social (Chrobot-Mason, Button, & DiClementi, 2001). Furthermore, when gender and sexual minority individuals are open about their identity, they report greater commitment to the organisation, greater job satisfaction, and less role conflict between work-life and home-life

Chapter 1: Introduction

(Day & Schoenrade, 1997). In a recent meta-analysis, Sabat and colleagues (2020) concluded that stigma disclosure did not result in more overall positive or negative intrapersonal or interpersonal outcomes in workplace and nonworkplace settings alike. In fact, only individuals who disclosed an identity that was less visible experienced a net positive outcome. Taken together, these findings suggest that stigma management is not only crucial to close and professional relationship development, but that individuals should adjust their levels of self-disclosure within and across these contexts, particularly when the identity was previously concealed.

One relatively recent avenue through which people living with a CSI can safely 'come out' and achieve social support is through the use of social media. The rapid rise of social media websites such as Facebook, Twitter, and Reddit, has changed self-disclosure and the way people form and maintain relationships (Willems et al., 2019). Participation in online communities not only provides relief through the written practice (Pennebaker, 1997), according to work by Andalibi and Forte (2018), disclosures on anonymous support sites (i.e., Reddit) facilitated further disclosure on identified social media accounts such as Facebook. In this study, researchers interviewed 27 women who disclosed their pregnancy loss on Facebook. They found that participants revealed their pregnancy loss online not only to elicit social support, but also as a means to prevent in-person disclosure. Thus, social networking sites and online forums provide a digital landscape which facilitates the management of the disclosure process (Andalibi & Forte, 2018). As social media self-disclosure and 'hashtag activism' has the potential to reach a wide audience, these disclosures not only impact individual relationships, but can have sociocultural implications as well, which will be discussed in more detail below.

Chapter 1: Introduction

Disclosure Goals and Motivation

Given the variability within and between situational (e.g., workplace, online forum) and relational contexts (e.g., close friend, boss, online stranger), the stigma target will often anticipate how a perceiver (i.e., confidant) may react to a CSI disclosure. Of course, the decision to disclose a CSI is not quite as simple as predicting overtly positive or negative reactions. Researchers have demonstrated numerous goals for disclosure including receiving social support (Earnshaw, Lang, Lippitt, Jin, & Chaudoir, 2015), reducing cognitive burden of concealment (Pachankis, 2007), and control over self-presentation (Smart & Wegner, 1999).

According to Beals, Peplau, and Gable (2009), one goal of CSI management is to cultivate social support. For example, women who had abortions were less likely to disclose to people they predicted would not support their decision (Major & Gramzow, 1999). Furthermore, for people living with HIV, both interpersonal social support and community social support provided a buffer against the association between experienced stigma and disease progression (Earnshaw et al., 2015). The response and support of a disclosure confidant, in fact, can play a crucial role in disclosure progression over time. Chaudoir and Quinn (2010) asked participants to consider the first time they disclosed their CSI and to recall how positive the experience was by rating the disclosure on the following domains: how accepting the confidant was, how supportive the confidant was, and how positive the event was overall. They found that positive first-time disclosure experiences not only reduced fear of disclosure, but increased psychological well-being over time; on the other hand, a negative first-disclosure was associated with greater fear of disclosure, and fewer instances of revealing in the future. Despite the long-term importance of received social support, we still know very little about how people communicate anticipated and desired support during a disclosure event. This gap is addressed in this thesis through a qualitative analysis of CSI disclosure (chapter 2).

Chapter 1: Introduction

Social support, however, is only one reason individuals choose to reveal. The extant literature has identified many motivations towards the decision to disclose (or actively conceal) a CSI. Individuals may choose to reveal as a means of identity management (Ragins, 2008), educating others about the identity (Goldberg, 2010), or to seek advice or resources (Andalibi et al., 2016). Given the numerous and disparate goals for initiating a disclosure, theoretical (Chaudoir & Fisher, 2010, Jones & King, 2014; Omarzu, 2000; Pachankis, 2007) and empirical models (Derlega, Winstead, Greene, Serovich, & Elwood, 2004) have expounded the role of antecedent goals within the disclosure process in an attempt to clarify the inherent intricacy and predict positive and/or negative outcomes. In the Disclosure Processes Model (DPM), Chaudoir and Fisher (2010) provide a relatively parsimonious account of the disclosure process in which antecedent goals can predict long-term disclosure events. These goals for disclosing are either approach-oriented (aimed at achieving positive outcomes such as increased trust) or avoidance-oriented (aimed at avoiding negative outcomes such as rejection). Activation of these motivational systems are thought to influence both the verbal content and behaviours when revealing a CSI, and have far reaching implications for future disclosure decisions. As empirical evidence has pointed to the importance of disclosure history on the trajectory of identity management (Quinn & Chaudoir, 2009), this model incorporated a feedback loop such that positive disclosure experiences will enhance future decisions to reveal while negative responses would result in a pattern of active concealment. Therefore, it is crucial to understand the factors that will lead to positive interpersonal outcome.

The DPM predicts that approach-oriented disclosures are likely to entail behaviours that elicit a more positive response from a confidant, whereas individuals with more avoidant goals are not only less likely to disclose, but are more likely to experience negative outcomes when they do (Chaudoir, Fisher, & Simoni, 2011). However, little is known how these linguistic and nonverbal actions are expressed during approach or avoidance motivated disclosures,

implicitly or overtly. Therefore, this thesis considered how antecedent motivation influenced a disclosure event across multiple modalities including language use and postural movement dynamics. In doing so, the papers presented (particularly papers II and III) take an embodied approach described below.

Embodied Social Interaction

Just as the disclosure process is context dependent, recent work in cognitive science, philosophy, and social psychology suggest that behaviour, cognition, and feelings are embodied such that the social, environmental, and motivational contexts impact cognition and behaviour (Meier, Schnall, Schwarz & Bargh, 2012). Contrary to the leading dualistic assumption of the middle 20th century that the mind operates as an information processing machine, embodied cognition argues that thoughts and behaviour are best explained in terms of the brain, body, and environment as a singular, complex unit of analysis (Eiler, Kallen, & Richardson, 2017; Wilson & Golonka, 2013). As such, human emotion, cognition, and behaviour are inextricably linked. Indeed, emotional states are often described metaphorically through haptic and physical sensations of temperature, distance, and weight (Leung et al., 2012). For example, affiliation and happiness is often associated with 'warmth' whereas negative emotion is associated with 'cold' (e.g., having 'warm' feelings toward someone, or giving a friend the 'cold-shoulder').

Research in the Gibsonian tradition of ecological psychology (Gibson, 1966; Hirose, 2002) and situated cognition (Smith & Collins, 2010) suggests that cognition is not only influenced by, but exists across the brain, body, and environment system (for review, see Carr, Kever, & Winkielman, 2018; Smith & Semin, 2004; Wilson & Golonka, 2013). Therefore, motivation (e.g., activation of the approach-avoidance motivational systems) and psychological states are reflected not only in discrete behaviours such as a frown signalling negative affect, but is reflected within dynamic, and often social, movements such as

interpersonal behavioural synchrony (Hove & Risen, 2009; Macpherson, Marie, Schon, & Miles, 2019; Schmidt & Richardson, 2008) and postural coordination (Varlet, Marin, Lagarde, & Bardy, 2011). For instance, evidence of socially situated cognition embodied in the coordination dynamics of individuals is demonstrated in the relative breakdown of interpersonal coordination that occurs during an argument (Paxton & Dale, 2017). When comparing bodily synchrony between dyads during argumentative and affiliative conversations, Paxton and Dale (2017) found that bodily synchrony—as measured by head movements—was significantly degraded during an argument and instead displayed distinct turn taking behaviour suggesting that cooperative action can manifest in distinct ways to meet the demands of the task.

Though much of the extant work on interpersonal coordination proposes that spontaneous synchronization aids in building rapport (Bernieri, 1988; Chartrand, Maddux, & Laken, 2005; Miles, Nind, & Macrae, 2009), deviation from social norms has been demonstrated to reduce this phenomenon. In a study in which a research confederate (posed as a study partner) arrived either on time or 15 minutes late, participants were significantly less coordinated in stepping movements with their tardy study partner compared to confederates who were on time. Furthermore, ratings of positive rapport in this experiment was associated with greater synchronization (Miles, Griffiths, Richardson, & Macrae, 2009). This study supports the supposition that coordination is not just a natural interpersonal occurrence, but can be influenced by external factors and, in turn, effect rapport.

Furthermore, variation in mental health symptomology has also demonstrated a breakdown in interpersonal coordination (Macpherson et al., 2019). For example, when patients with schizophrenia were instructed to intentionally coordinate the movement of a pendulum with another (neurotypical) participant, behavioural synchrony was impaired (Varlet et. al., 2012). While this work provides insight into coordination between the target and

perceiver of CSI, control participants (i.e., the perceivers) were not aware of the mental health status of the experimental group (i.e., the targets). Nonetheless, these findings have important implications for CSI disclosure—particularly for those living with a mental health disorder—as variation in symptomology may disrupt coordination in an interaction, even prior to disclosure. However, despite the potential for reduced coordination, little work has been done to assess the breakdown in synchronization within stigma target-perceiver interactions when the identity is salient. In one study in which Lumsden, Miles, and Macrae (2012) asked participants to rate the degree to which they *perceived* coordination between congruent race and incongruent race paired hands, participants rated the incongruent dyads as less synchronized compared to the same race dyads, despite there being no actual difference. This provides tentative evidence that stigma can influence the perception of coordination.

As existing research suggests that coordination tends to become disrupted when an individual in the pair upsets social norms (Miles et. al., 2009), and the perception of synchronization is lower for mixed race pairs (Lumsden et al., 2012), it is predicted that the individuals in a dyad would display less coordination in a target-perceiver interaction, particularly considering the ambiguity that arises from such contact (Hamel et. al., 2019). In the only study to my knowledge in which researchers intentionally measured spontaneous coordination during a stigma target-perceiver interaction, results found *greater* bodily synchrony in incongruent race dyads compared to congruent dyads. In this study, Hamel and colleagues (2019) analysed video recordings of oncology appointments between White doctors and either White or Black patients in the United States. Surprisingly, results suggest greater global synchronization in racially discordant exchanges, particularly when the patient was leading the interaction despite poorer health outcomes for Black patients in America (Kilbourne, Switzer, Hyman, Crowley-Matoka, & Fine, 2006), and implicit bias embedded in the health care system (Dovidio, Gaertner, Saguy, & Halabi, 2008). Black patients here seem

Chapter 1: Introduction

to drive coordination in the health care setting, potentially in an attempt to enhance information exchange and ameliorate communication.

Though contrary to what researchers predicted, this was not the first study to suggest greater physical coordination between mismatched pairs. Using a minimal groups paradigm, Miles, Lumsden, Richardson, and Macrae (2011) reported more in-phase synchrony of rhythmic arm movements in discordant minimal group pairs. As such, spontaneous synchronization may further serve to reduce social distance between dissimilar individuals (Hove & Risen, 2009; Miles et. al., 2011). Social distancing, borrowed from epidemiology, consists of behaviours that decrease contact between susceptible and infected individuals to reduce disease transmission (Ahmed, Zviedrite, & Uzicanin, 2018). People, however, can also distance themselves from stigmatized groups by increasing physical distance (Keene & Padilla, 2014) or adjusting personal opinions to differentiate themselves from the stigmatized other (Swim, Ferguson, & Hyers, 1999). Therefore, the function of spontaneous synchronization is still unclear. In some cases, a breakdown in coordination seems to increase distance within tenuous dyads. In other scenarios, however, discordant pairs enhanced their coordination, perhaps to reconcile potential relationship ambiguity. As such, papers II and III in this thesis address these current gaps in distinct ways. First, paper II investigated the embodiment of situational context during a disclosure event in both postural activity and language dynamics through the lens of dynamical systems theory. This paper demonstrates the impact of goal motivation on the process of disclosing a concealable stigma. Paper III aimed to elucidate the function of spontaneous synchronization during stigma target-perceiver interactions by measuring the degree to which individuals synchronise their movements with someone who discloses a concealable stigma. These two papers help understand how disclosure context impacts behavioural dynamics and interpersonal synchrony

Chapter 1: Introduction

The Stigma Process as a Complex Dynamical System

Though the chapters presented in this thesis focus on different levels of CSI disclosure separately, collectively they demonstrate the nested and dynamic properties of stigma disclosure. To better conceptualise this process, this thesis relies upon dynamical systems theory and complexity science to provide a framework for understanding the interactions within and between the higher level (e.g., relationship context, cultural norms and beliefs) and lower level constraints (e.g., disclosure motivation, and anticipated support) which give rise to specific CSI disclosure events (Paxton & Dale, 2017; Richardson, Dale, & Marsh, 2014; Vallacher & Nowack, 1994). Complex dynamical systems theory posits that the behaviour of a system is not determined by a single process or factor but emerges from the interaction of lower and higher order processes or factors (Eiler, Kallen, Harrison, & Richardson, 2013). As such, when researching the disclosure process, one must consider the entailed structure of perceptual, motor, cognitive, social and cultural processes as the system of analysis (Richardson et al., 2014).

Though not motivated by complexity science, Pryor and Reeder (2011) suggested a nested model of stigma which, in essence, conforms to the interaction dominant dynamics described above. In this model, stigma arises from the interactions between self-stigma, stigma by association (i.e., courtesy stigma), and structural stigma—at the core, and driving these three levels, is public stigma, or the overall consensus that a social attribute is devalued (see figure 1). As such, this networked structure of stigma may be conceptualised as a complex dynamical system, of which the interaction between the component parts give rise to the emergent phenomenon of stigmatization. A crucial aspect of complex dynamical systems is the self-organisation towards a stable behavioural state following a perturbation or disruption to the system (Shinbrot, Grebogi, Ott, & York, 1993). Therefore, this thesis investigated the impact

of concealable stigma disclosure as a perturbation to the individual, within a dyad, and at the wider cultural level.
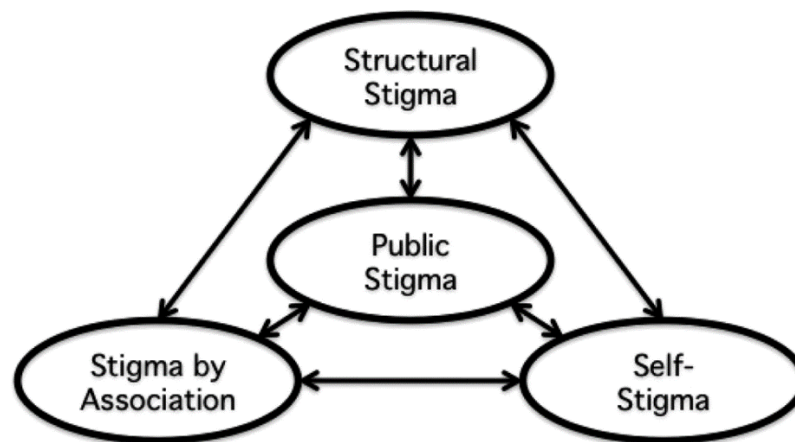
Figure 1. Four types of stigma (taken from Pryor & Reeder, 2011) which demonstrate the nested structure of stigmatization, and the importance of the interaction between these levels.

Self-stigma refers to the social and psychological impact of possessing a stigmatizing attribute. It involves both the anxiety of experiencing stigmatization and the potential internalization of the negative beliefs around such attributes (Bos et al., 2013). It is well-documented that internalised stigmatization is associated with greater psychological distress (Quinn & Earnshaw, 2011). However, through CSI disclosure, individuals may alleviate this distress and improve overall well-being (Jonzon & Lindblad, 2005; Waddell & Messeri, 2006). Furthermore, Chaudoir and Fisher (2010) theorized that intrapersonal antecedent motivation for a CSI disclosure would impact the outcome of a disclosure event, either positively or negatively, through the activation of approach or avoidance motivational systems. This body of work investigated the ways in which antecedent motivations influence individual level characteristics of a disclosure event including disclosure content and individual behavioural dynamics in papers I and II.

While extant research suggests that CSI disclosure may lead to many positive individual-level outcomes, as described above, this is often the result of experienced social support. As CSI disclosure may produce stigma by association for the perceiver, individuals tend to disclose in relationships and environments that they assess as being supportive to limit

experiences of discrimination (Bos et al., 2009; Kelly & McKillop, 1996; Ragins, 2008; Pasek, Filip-Crawford, & Cook, 2017; Ullman, 1996). Though people tend to disclose within a predicted supportive environment, a CSI disclosure often results in an immediate ambiguity, and an inevitable restructuring of the relationship. Pryor and colleagues (2004) described this fluctuation of the perceiver as an "immediate and automatic aversion to stigmatized individuals," this may be considered the critical fluctuations necessary to bring rise to a new stable state in a complex system (Schmidt, Carello, & Turvey, 1990). Pryor and colleagues (2004) go on to explain that a perceiver will then temper their initial reaction towards provided support and acceptance or result in further polarization away from the stigma target. This restructuring of close relationships has been noted following the disclosure of experienced sexual violence. In a qualitative study of close relationship dyads, 91% of participants stated that their relationship changed following a disclosure, and this change persisted over time either positively or negatively (O'Callaghan et al., 2018). Therefore, this thesis also explored the effect of concealable stigma disclosure on both interpersonal rapport and the embodiment of relationship ambiguity through behavioural dynamics within a dyad in paper III.

Finally, whereas stigmatization immediately impacts individuals and relationship development, this process is legitimized through the maintenance of social norms within structural institutions (Pryor & Reeder, 2011). However, CSI disclosure can also bring traditionally silenced voices of those who live with a hidden stigma into the forefront and thus propagate fundamental change at the sociocultural level (Heijnders & Van Der Meij, 2006). An example of this process may be described by the emergence of hashtag movements and counterpublic communication on social media which arise to support the marginalized, and in turn sheds light on the ubiquity of concealable stigma at the structural level (Budenz et al., 2019). Counterpublics are arenas that develop outside of the majority public discourse, or the mainstream societal ideals, through which individuals can communicate with similar others

Chapter 1: Introduction

(Squires, 2002). Importantly, through hashtag movements such as #MeToo, #NotOkay, #NationalComingOutDay, #BlackLivesMatter, and #WhyIDidntReport, individuals can disclose their experiences as a collective to address and shift societal stigma (Gallagher et al., 2019; Jackson & Welles, 2015). With the rise of these social media movements, many feel a tension between the motivations to conceal due to fear of stigmatization, and the desire to increase visibility of hidden identities (Pasek et al., 2017). Therefore, the final paper in this thesis explored the function of the widescale sexual violence disclosure hashtag movement, #WhyIDidntReport to understand CSI disclosure at the structural level. Importantly, CSI disclosure is influenced by the stigma process at each of these levels, from the individual to structural. As such, a multimodal and nested approach towards the stigma process is crucial to advancing our understanding of when and how people share a CSI with others.

Overall Thesis Aims and Structure

The motivation for this thesis was to explore and describe the ways in which people reveal stigmatizing information about themselves across social contexts and via multiple modalities. This thesis comprises four papers which expand our understanding of how people reveal a CSI, and interpersonal disclosure outcomes, through experimental and qualitative methods as well as an investigation of naturalistic data. Abundant evidence supports the link between social support and positive CSI disclosure experiences on psychological well-being (Earnshaw et al., 2019; Weisz et al., 2016). Yet very little is known about the ways in which people reveal their stigmatized identities, and how a disclosure event impacts the dyad immediately following a disclosure.

The data presented in the first two papers of this thesis come from one study in which participants who have a CSI simulated a disclosure event in the laboratory. This study is the first of its kind to investigate concealable stigma disclosure through a simulated disclosure event to an imagined other. The first paper (chapter 2) employed thematic analysis techniques

Chapter 1: Introduction

to characterise the ways in which individuals share their CSI with others, as well as how desired social support and post-disclosure goals are communicated. This chapter also described the differences in disclosure strategies towards close other and professional other confidants, as well as the impact of approach and avoidance motivation on disclosure depth. Within this thesis, this paper provides a detailed introduction into the actual disclosure process. Within the wider literature, the results of this paper offer a framework for better understanding the disclosure strategies that may enhance positive outcomes. This chapter was submitted to the *Journal of Applied Social Psychology*.

Paper II extended the work reported in the previous chapter by investigating the embodiment of antecedent goals (approach and avoidance) and disclosure context (close other and professional other relationships) through postural activity and language dynamics. This paper draws from dynamical systems theory and ecological psychology to develop novel methodologies and employ nonlinear analyses to address important questions within the disclosure and embodiment literature, namely, how psychological states are embodied within behavioural dynamics during a disclosure event. This paper was submitted for consideration in *Nature Scientific Reports*.

Whereas papers I and II investigated the disclosure process at the intrapersonal level through a simulated CSI disclosure event, paper III considers the confidant's (or perceiver's) viewpoint. The main aim of this paper was to determine how stigma disclosure (depression diagnosis or bisexual identity) might disrupt interpersonal synchronization and coordinated action, and whether such disruptions might influence attitude change and affiliation. This paper was prepared and submitted for consideration as a peer reviewed conference presentation and publication in the *Proceedings of the 42nd Annual Conference of the Cognitive Science Society.*

Finally, while the first three papers in this thesis used experimental methods to understand the intra- and interpersonal CSI disclosure processes, paper IV analysed a corpus

Chapter 1: Introduction

of 20,397 tweets containing the hashtag #WhyIDidntReport which emerged to elucidate reasons for nondisclosure of sexual violence. This hashtag movement was a direct response to those in power who attempted to discredit Dr. Christine Blasey Ford after she publicly stated on 16 September 2018 that she was sexually assaulted by United States Supreme Court nominee Brett Kavanaugh[ii]. Following her allegations, then-President Donald Trump called into question the veracity of her statement as she had not reported the abuse to law enforcement previously. The tweets included in this paper describe the numerous systemic barriers to disclosing sexual violence and are analysed using a qualitative content analysis and network analysis of language sentiment. As such, this is the only chapter in the thesis that examined the disclosure of a singular CSI type (i.e., sexual violence). Here, I sought to uncover the existing barriers to disclose sexual trauma and to understand the function of participation in online disclosure within the fabric of the stigma process through the semantic network of the online movement. This paper was submitted to the journal *Violence Against Women*. The final chapter (chapter 6) provided an overall discussion of this research program and considers the implications for future research directions.

[ii] Following her public disclosure, Dr. Christine Blasey Ford testified regarding the assault to a Senate Judiciary Committee on 27 September 2018. Succeeding this hearing and a subsequent FBI investigation, Brett Kavanaugh's nomination was confirmed on 6 October and he now holds a lifetime appointment to the United States Supreme Court.

Chapter 1: Introduction

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Chapter 2

Full disclosure: Towards a holistic understanding of disclosure of a concealable

stigmatized identity in close and professional relationships

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H.D., S.C., and R.K. conceived of the research idea. H.D. and R.K. designed the experiment and H.D. and A.F. collected data. H.D., A.F., and E.O., analysed and interpreted the results. H.D. prepared a draft of the manuscript and A.F., E.O., S.C., and R.K., edited and revised the manuscript prior to submission.

Chapter 2: Content of Concealable Stigma Disclosure

Abstract: Individuals living with a concealable stigmatized identity (CSI) often make decisions regarding how and when to reveal their hidden stigma. Despite the risk of rejection by friends and family or negative workplace outcomes when a CSI is revealed, social support and reduced cognitive burden following a disclosure often improves psychological and physical health outcomes. Although previous research has examined post-disclosure outcomes among individuals living with CSIs, little is known exactly how people reveal stigmatizing information about themselves. As such, we draw from existing disclosure models to describe the content of CSI disclosure to close and professional confidants. Participants ($N = 33$) who self-disclosed living with a CSI (e.g., mental health disorder, gender or sexual minority status, sexual assault experience) simulated a disclosure to a close confidant and a professional confidant following instruction to use approach or avoidance disclosure goals. Using thematic analysis procedures, we analysed 66 CSI disclosure transcripts and found that participants not only shared CSI related information, but also identified their *reasons for disclosure/concealment*, *anticipated response*, and *post-disclosure goals*. We also found that, when disclosing to a professional other, participants were more likely to do so in order to shift the relationship from professional to more intimate while participants were more likely to disclose to friends and family in order to mend a close relationship. Moreover, when instructed to use avoidance goals, participants were more likely to provide an implicit identity disclosure compared to those instructed to use approach goals. Implications for practitioners and future research are discussed.

Keywords: Concealable Stigma, Social Support, Disclosure, Stigma, Thematic Analysis

Chapter 2: Content of Concealable Stigma Disclosure

Introduction

Individuals living with a concealable stigmatized identity (CSI; e.g., mental health disorder, gender or sexual minority identity [GSM], sexual assault experience) often face the difficult dilemma of deciding when and how to reveal their stigma to others (Goffman, 1963; Jones et. al., 1984). Although disclosing socially stigmatizing attributes can potentially lead to negative consequences such as social rejection (Feldman & Crandall, 2007), workplace discrimination (Jones & King, 2013), secondary victimization (Ullman, 1999), and physical harm (Herek, Gillis, Cogan, & Glunt, 1997), sharing a CSI is not always deleterious. Indeed, a number of studies have found evidence to suggest that disclosure can (a) facilitate social and emotional support (Beals, Peplau, & Gable, 2009), (b) strengthen close relationships (Quinn & Earnshaw, 2013), (c) reduce cognitive burden (Smart & Wegner, 1999), and (d) contribute to antiretroviral medication adherence (Stirratt et al., 2006).

Given the wide-reaching outcomes associated with disclosure, it is important to understand what strategies people living with CSIs employ when sharing their identities with individuals in different spheres of their lives (e.g., friends, family members, professors, bosses). Although prior research has examined positive and negative disclosure outcomes across various life domains, little is known about the type of identity-related information that individuals share with their disclosure targets (Chaudoir & Quinn, 2010; Ragins, 2008). Thus, the current study sought to address this gap in the literature by using thematic qualitative analysis to examine transcripts of individuals who simulated disclosures within the context of close and professional relationships.

Disclosure Context

Individuals' relationships with other people often differs as a function of domain context (e.g., workplace, family life, and social setting). Consequently, those living with CSIs may adopt different stigma management strategies depending on the social context they find

themselves in (e.g., work vs. nonwork domains; Ragins, 2008). For example, whereas an individual might be relatively open about their identity with friends and family, they may be relatively closeted in the workplace. These "disclosure disconnects", or discrepancies in "outness," may lead to psychological stress and negatively impact job satisfaction, particularly when individuals anticipate low social support upon revealing their stigmatized identity (Griffith & Hebl, 2002). In fact, many people may feel motivated to keep a CSI hidden completely from their colleagues, as revealing such information could have a detrimental impact on their career path and job outcomes (Flett, 2012). For example, people living with a mental health disorder can experience impaired job mobility following disclosure (Ståhl & Stiwne, 2013), and GSM individuals may conceal their identity due to fear of losing their job (Jones & King, 2013). Despite these potential negative job outcomes, research suggests that identity disclosure in the workplace can improve mental health outcomes (Kelley, Britt, Adler, & Bliese, 2014) and increase job satisfaction (Follmer, Sabat, Suita, 2019), particularly when individuals perceive organisational support. Moreover, Adams and Webster (2017) found that leaders who disclosed a transgender identity early on were rated more favourably compared to those who were involuntarily found out.

Whereas individuals face professional risks when disclosing a CSI in a workplace setting, the fear of stigmatization by a friend or family member may be even more salient (O'Callaghan, Lorenz, Ullman, & Kirkner, 2018). However, Weisz, Quinn, and Williams (2016) found that the overall level of "outness" someone reports, the fewer physical illness symptoms they experienced, particularly when they reported receiving high levels of social support. Research suggests a robust relationship between social support following a disclosure and quality of life (Gielen, McDonnell, Wu, O'Campo & Faden, 2001), better adherence to HIV medication (Stirrat et al., 2006), and psychological outcomes (Pucket, Woodward, Mereish & Pantalone,

2015). Conversely, when people perceive less support, they report higher levels of depression (Dupuis & Ramsey, 2011).

Antecedent Motivation and Post-Disclosure Outcomes

Much of the existing work on CSI disclosure aims to understand why individuals are motivated to disclose in the first place. Indeed, there are numerous models that discuss the importance of forming antecedent goals prior to a disclosure event (i.e., antecedent goals; Chaudoir & Fisher, 2010; Omarzu, 2000; Pachankis, 2007). For example, the Disclosure Processes Model (DPM) suggests that individuals disclose their stigmatizing identities using either approach-oriented or avoidance-oriented goals. These motivational systems are interested in either achieving positive outcomes (approach) or avoiding negative outcomes (avoidance). Further, Garcia and Crocker (2008) suggest that individuals disclose with either egosystem or ecosystem goals in mind. Whereas egosystem goals consider how disclosing might enhance or maintain desired self-images, ecosystem goals consider how disclosing might yield positive outcomes for both the discloser and their confidant. While approach/avoidance and egosystem/ecosystem goals are construed as distinct motivational orientations, they are both thought to impact the disclosure event and subsequent outcomes. For example, individuals living with HIV who were motivated by approach orientation rather than avoidance orientation were more likely to disclose to close others (Chaudoir, Fisher, & Simoni, 2011). Further, research has found that people who disclose a CSI using ecosystem goals feel more positively about disclosing compared to those who use egosystem goals (Chaudoir & Quinn, 2010).

Given that the existing models of CSI disclosure incorporate antecedent goals as impacting the disclosure event, it is important to identify the ways in which these motivations are manifested in language and disclosure strategies. In this study, we used the DPM as an overall framework for the disclosure process, while utilizing existing models to ground our analyses. It is important to understand how these goals impact disclosure decisions and

outcomes, as social support following a disclosure event positively impacts those who reveal a CSI (e.g., report improved self-esteem, fewer depressive symptoms, and greater quality of life). Therefore, in the present study we examined how individuals living with a CSI spontaneously expressed their anticipated goals following a disclosure event.

Present Study

Self-disclosure is a continuous process whereby individuals can share their concealable stigma to varying degrees across life domains. Consequently, capturing a disclosure as it happens has proven relatively difficult to achieve. Despite our growing understanding of the disclosure process through antecedent motivations and disclosure outcomes, little is yet known about the disclosure experience itself.

However, with the growth of online communities such as Reddit, Twitter, and Facebook, there have been notable investigations into the content of a CSI disclosure within social media domains (see Andalibi, Haimson, Choudhury, & Forte, 2018; Eiler, Al-Kire, Doyle, & Wayment, 2019). In a qualitative examination of sexual assault disclosure on Reddit, Andalibi, et al. (2016) analysed sexual assault disclosures and found that the majority of posts analysed (68.3%) sought direct social support following their written disclosure. While online spaces provide insight into how people share a concealable stigma, no published research to date has examined how disclosure events transpire within scenarios more similar to in person disclosure. To address this methodological shortcoming, the current study employed a simulated disclosure paradigm to capture the content of a CSI disclosure to close-other and professional-other confidants after instructing individuals with either approach-oriented or avoidance-oriented goals.

Participants role-played a disclosure to an imagined target (i.e., their chosen disclosure confidant) in a controlled laboratory environment allowing them to share their concealable stigma in real time, without the associated risks of interpersonal disclosure. Therefore, we were

able to analyse stigma disclosure at the semantic level to provide a broad understanding of how people share a CSI. In summary, the current study sought to answer the following research questions:

[1] Grounded in existing models of the disclosure process, what disclosure strategies do people employ when sharing a CSI to close-other and professional-other confidants?

[2] How does disclosure motivation (i.e., approach and avoidance) impact the content of a CSI disclosure?

[3] How do individuals express their desired social support and post-disclosure outcomes when revealing a CSI?

Method

Participants and Data Reduction

As part of a larger laboratory study, participants ($N = 43$) who self-identified as having a CSI were recruited from a large Midwestern university through the psychology department participant pool or recruitment flyers posted on campus. Participants received partial course credit or $20.00 as compensation for their time. A total of 10 participants were excluded from analysis: four participants did not consent to being audio recorded during their role-played disclosures, four participant's audio recordings were too quiet to provide a reliable transcription, one participant did not have audio data due to a technical error during data collection, and one participant was excluded from the analysis as they did not appropriately follow task instructions. Therefore, 33 participants were included in this thematic analysis. The majority of participants self-identified as female ($n = 26$), with 5 self-identifying as male, and 2 participants self-identified as agender (i.e., someone who does not identify with a binary gender). The majority of participants identified as White/Caucasian ($n = 29$), with 3 participants self-identifying as Black/African-American, and 1 participant self-identified as Asian/Pacific Islander. Participant's ages ranged from 18 to 32 years ($M = 20.36$, $SD = 3.3$). See the supplementary material for this chapter (Table S1) for a complete list of participant demographic information and CSIs represented in this sample.

Chapter 2: Content of Concealable Stigma Disclosure

Data Collection and Procedure

All study procedures were approved by the university's Institutional Review Board. Participants provided informed written consent, agreeing to take part in the overall study and to allow the researcher to audio record their verbal disclosure. Prior to the role-played disclosures, participants were asked to think about and describe a secret that they do not often share with others. This question was open-ended, allowing participants to provide as much information about their identity as they wanted. Further, participants were not explicitly told to consider a concealable stigma from the list identified in the online pre-screening, though each participant did. Next, participants were told to consider a friend or family member (close other; CO) and a co-worker, boss, or professor (professional other; PO) who they have not shared their identity with but would like to do so. Participants were then instructed to type two letters sharing their CSI, one to each confidant, following a prompt to disclose with either approach or avoidance goals in mind (approach and avoidance motivation was randomized between participants). After typing each letter, participants rated how supportive they expected their chosen confidant would be. During this part of the laboratory study, participants were seated at a computer and the researcher was not in the room. After participants typed both disclosure letters, they were instructed to simulate the disclosures as if the person they chose was in the room with them. The order in which participants completed the role-played disclosures was counterbalanced such that half of the participants disclosed to their CO confidant first and the other half disclosed to their PO confidant first. During this portion of the experiment, participants stood facing a screen on which the disclosure letter was projected and were told that they could use their written letter as a guide, but that they did not have to follow it verbatim. A laptop equipped with Audacity 2.1.1 software (2015) was used to record the verbal disclosures. During the course of the study, the researcher only entered the room to provide instructions. These data were collected as part of a larger laboratory study. As such,

participants had wired Polhemus motion tracking sensors (FASTRAK, Polhemus, VT, USA) attached at the head and the waist during the simulated disclosures (see chapter 3 of this thesis for a description of the set up and results and the supplemental material to chapter 3 for participant instructions as well as the OSF repository for this project [https://osf.io/d6ec7/]). All data were collected between September 2015 and April 2016.

Measure

Social Support. To capture how supportive participants anticipated their chosen confidant would be following the disclosure, participants responded to a 1-item measure of social support following each typed disclosure. Participants answered the question, "*If you were to tell this person your secret, how supportive do you think they would be*" on a 5-point, Likert-type scale (1 = *not at all supportive* to 5 = *very supportive*).

Analytical Approach

A total of 66 role-played disclosure transcriptions from 33 participants were analysed using a thematic analysis framework and followed the 6-phase iterative process detailed by Braun and Clarke (2006). This approach is ideal for these data as it provides flexibility in the qualitative analysis. While we grounded our research questions in existing disclosure models, thematic analysis allowed for unbiased interpretation of the data when identifying patterns and themes (Braun & Clarke, 2006).

Phase 1: Disclosure transcription and data familiarization. Two members of the research team transcribed all audio-recorded disclosure roleplays verbatim with the first author checking and confirming the transcriptions for accuracy. During this phase, the first two authors individually read and re-read the transcriptions to become familiar with the data. At this time, notes and memos were created to identify broad, overarching concepts within the simulated disclosures.

Phase 2: Generation of initial codes. During this phase, the first two co-authors independently identified text excerpts to combine based on similarity in content. Each researcher in this phase generated an Excel spreadsheet grouping together coded excerpts for half of the disclosures.

Phases 3 and 4: Identifying and reviewing themes in the data. In phases 3 and 4, the first two co-authors organised the existing initial codes into superordinate themes, under which more specific subthemes were subsumed. Following the initial identification of themes, the two co-authors compared the existing identified codes and began the iterative process of defining a coding dictionary containing superordinate themes and subthemes. This process was completed multiple times to ensure the data were well represented by superordinate themes, and similar subthemes were combined.

Phase 5: Defining and naming themes. Following the creation of the coding dictionary the researchers completed phase 5 by revisiting the first half of the disclosure transcripts and independently coded the text based on the agreed dictionary using Microsoft Excel to organise the data and generate memos. Next, the two members of the research team discussed the placement of each coded text and any discrepancies were considered until 100% agreement was reached. Following this process, a third member of the research team independently analysed the coded text to ensure the coding dictionary encompassed all relevant concepts and ensured no overlap between subthemes (i.e., exclusive and exhaustive). The research team then discussed any discrepancies and consensus was met regarding the placement of themes. Overlapping concepts were collated in this phase. Finally, the first and second author completed step four and coded the last half of the transcribed disclosures according to the agreed upon coding dictionary. The third author then assessed the codes and the research team met to reach 100% agreement on the coded text.

Phase 6: Producing the report. Following this iterative procedure, the data were organised using QSR International's NVivo 12 software (2018). While these repetitive and collaborative analyses do not lend themselves to performing inter-rater reliability scores (see Braun and Clarke, 2013), the first two authors did code the identity disclosures as implicit or explicit with an excellent Cohen's Kappa (.93). It is also important to note that all data, including both CO and PO disclosures, as well as disclosures of all identity types were completed concurrently. Throughout the coding process, researchers began noting the degree to which certain themes were more prominent as a function of disclosure confidant (i.e., CO and PO) and disclosure identity. Each member of the research team participated in the data collection and has previously conducted research on stigma disclosure.

Results and Interpretation

Social Support

First, to determine if disclosure context or antecedent goal motivation impacted anticipated social support, a 2 (goal motivation: approach/avoidance) x 2 (confidant: CO/PO) mixed method analysis of variance was performed. Results suggested no main effect of antecedent motivation, disclosure confidant, or interaction on anticipated social support (all $F's < 1.27$, $p's > .27$). In fact, the majority of participants expected high levels of social support from their chosen confidants (75.78% of CO confidants and 90.91% of PO confidants were rated as being either *somewhat supportive* (4) or *very supportive* (5).

Qualitative Analysis

From the thematic analysis of 66 role-played disclosures, we identified four overarching themes that existed across all identity types and within disclosures to both CO and PO confidants. These themes include: 1) reasons for disclosure and concealment (e.g., live true self, explain behaviours, and fear of disclosure); 2) identity information (stigmatized identity disclosure, acquisition and trajectory, impact of identity on daily life, and anticipated social

support); 3) anticipated response of confidant; and 4) post-disclosure goals. The full coding dictionary and example excerpts can be found in the supplementary material to this chapter (Table S2).

Following each quoted excerpt, we include abbreviated information in parentheses to reflect CSI and disclosure characteristics (Participant identification number, CSI type, relationship to disclosure confidant, antecedent goals, anticipated social support). A complete list of parenthetical abbreviations can be found in Table 1.

Table 1. Full list of abbreviations following each coded excerpt.

Category	Reference word or phrase	Abbreviation
CSI type	Gender or sexual minority	GSM
	Mental health disorder	MHD
	Sexual assault experience	SA
	Eating disorder	ED
	Self-injury	SI
	Emotional abuse	EA
	Exotic dancer	E
Close other relationships	Family	F
	Friend	FR
	Roommate	RM
	Significant other	SO
Professional other relationships	Boss	B
	Mentor	M
	Professor	P
	Colleague	C
	Former teacher	FT
	Sport coach	SP
Motivational instruction	Approach	AP
	Avoidance	AV

The following sections describe each theme in detail and discuss observed differences between disclosures to CO and PO confidants. When appropriate, we also discuss aspects

unique to each identity type (e.g., mental health disorder, sexual assault experience, and gender/sexual minority identity) that exist within the structure of the reported themes.

Identity Information

Given the task instruction, the majority of participants disclosed their CSI to some degree, either explicitly or implicitly. Beyond simply stating their identity, however, participants also explained the trajectory of their CSI, how it impacts them on a daily basis, and different strategies they use to manage, or conceal their stigmatized identity.

Identity information: Identity disclosure. The majority of participants explicitly disclosed their CSI clearly and without ambiguity (27 CO and 30 PO):

> *I am a homosexual man and my partner is someone you are acquainted with (3, GSM, PO (B), AP, 4).*

> *The thing I am doing on the side is stripping (32, E, CO (FR), AV, 3).*

> *I have a mental disorder. It's called Trichotillomania which is a form of impulse control disorder (29, MHD, CO (FR), AP, 5).*

> *So, when I was 15, I was sexually assaulted by my boyfriend at the time (4, SA, CO (RM), AP, 5).*

This is unsurprising as the participants were specifically instructed to share their hidden identity through the simulated disclosure. Interestingly, however, seven disclosures contained an implicit description of their identity, requiring the confidant to speculate about the full identity being revealed. There was no single identity type or disclosure confidant that elicited an implicit disclosure. However, of the seven participants who disclosed implicitly in one or both of their simulated disclosures, six were instructed to use avoidance goals. For example, in a disclosure to a Participant's boss, one person said, *"Um, I guess I've been into guys basically all my life and have even found happiness along the way"* (13, GSM, PO (B), AP, 5). In this case, the Participant never overtly disclosed his sexual identity, rather, he simply stated that he is interested in men.

In another example, one Participant, who explicitly disclosed to a former teacher that she experienced bulimia, *"I used to be bulimic, so I would make myself eat but then, like, immediately throw it up"* (31, ED, PO (FT), AV, 5), was not as forthcoming with her friend. Instead, she professed:

> *I have overheard you…talking about, you know, like, the past struggles with self-harm and eating disorders, and I am here to tell you that I as well have gone through some eating disorders too, so you're not alone in that department* (31, ED, CO (FR), AV, 5).

Despite openly revealing her history with bulimia in one disclosure, the same participant decided to highlight the similarity between her experiences and her friends'.

It is important to note that two disclosures did not contain any implicit or explicit revelation, both of which were to CO confidants and instructed for avoidance goals. Despite not being coded into the identity disclosure theme, these two Participants were included in the overall analysis as they each provided a different perspective into the process of sharing a CSI. One Participant explicitly shared her depression diagnosis to her boss in the PO disclosure; however, she did not reveal her depression with her friend. Rather, this Participant shared in detail how she felt alone and isolated, *"I never let anyone know how different I had actually felt. I never even let you know until now. But anyways, my doctor, she helped me through a lot and helped me realize a lot of things about myself"* (8, MHD, CO (FR), AV, 5). Although she chose not to be forthright with her depression diagnosis, she did discuss the way she was feeling, the strides she made with her doctor, and why she did not share this information before.

Another Participant's case was unique compared to the other disclosures analysed as she chose to discuss her experience of maternal emotional abuse with her older sister who went through similar abuse. She was included in the analysis because she had never talked to her sister about their shared experience. As such, she did not disclose the abuse, but rather, provided an explanation for her behaviour saying:

> *I was a lot younger than you when you and mom started to really get into fights and I tried my best to stay out of those fights. It wasn't because I didn't love you or want to defend you, but I didn't know how to deal with all that negativity every single day* (25, EA, CO (F), AV, 2).

These excerpts support the idea that people use different strategies to disclose their CSI within different relationships.

Identity information: Acquisition and trajectory. Following the CSI identity disclosure, many participants (21 CO and 17 PO) provided more detailed information regarding the acquisition and trajectory of their CSI, telling a story of their experience with their respective identities. Whereas some participants gave straightforward narratives of their identity acquisition, others remained relatively vague. For example, one Participant frankly told her boss, *"I've had this mental illness for about two years"* (6, MHD, PO (B), AV, 4). Another shared the progression of her self-injury and an eating disorder with her mother:

> *I have been struggling with it [self-injury] since 5th grade….Um, and I have led you to believe that I am no longer cutting myself and I have been eating properly, I have actually been still cutting myself and it has gotten worse to the point that I was taken to urgent care to receive stitches and medical treatment and I'm still extremely obsessed about my weight to the point where I have been restricting and throwing up and I have been losing weight since coming to college* (10, ED & SI, CO (F), AV, 2).

In this case, the participant described the progression of her self-injury to clarify that she was still engaging in these behaviours—information she had previously withheld.

Conversely, a Participant described the trajectory of an abusive relationship to her friend to highlight that she was no longer experiencing the abuse: *"Not too long after we started dating, that's when the abuse started. First it was just emotional abuse, insults, things that really lowered my self-esteem. Then the physical and sexual abuse started soon after."* She continued to describe the nature of the controlling relationship and at the end of the simulated disclosure she reiterated, *"I finally got the courage to break up with him, and it was the best thing I could have done. And I started getting my friends back"* (26, SA, CO (FR), AP, 5). Similarly, a Participant who disclosed depression and anxiety, told her mentor that she has been

able to manage her symptoms, *"Today I'm doing fine. It took me four years, but my medicine is working and I'm going to college"* (5, MHD, PO (M), AP, 5).

While participants who disclosed a mental health disorder, eating disorder, self-injury, or sexual assault experience generally described the age when these experiences began, and how they have progressed over time, those sharing a gender or sexual minority identity highlighted that they have "always been this way." For example, when sharing her bisexual identity with her boss, a Participant spoke of her trajectory towards a clearer understanding of her identity, *"You know, it's definitely a huge part of who I am and I've really known I was bi my whole life, but I was really able to figure it out and put a label on it when I was a freshman in college"* (24, GSM, PO (B), AV, 5).

Although this theme was endorsed in both CO and PO disclosures, when disclosing to family members, participants did so in order to reassure or remind the confidant that this information does not change who they are as a person. For example, when one Participant shared his gay identity with his grandfather, he said, *"I need to stress this to you more than anything, I'm the same person, and I have always been the same person, this was something that I was born with"* (3, GSM, CO (F), AP, 1). Another participant shared a similar sentiment with her grandmother, "*I just wanted to let you know that I am in a situation where I am loving a woman. And I do love women…. I am a lesbian and it's going to be there my whole life"* (15, GSM, CO (F), AP, 3).

Consistent with previous work, these excerpts suggest that participants endorse their identity as being immutable (Costa & Dar-Nimrod, 2015. This may be particularly relevant when disclosing to an unsupportive confidant as the belief that a stigmatized identity is directly controllable has been shown to reduce sympathy and support (King, 2001).

Identity information: Impact of identity on daily life. In addition to providing information that was directly related to the CSI and trajectory, participants also explained how

their identity impacts them day to day (18 CO and 21 PO). For example, a Participant described

how the sexual violence she experienced negatively impacted her other relationships:

> *It hurts me to know that [perpetrator] thought so little of me to treat me so awful. I find myself unable to address people and extremely uncomfortable in social situations. I seem to think a lot, if someone that was supposed to care about me would treat me so awful, then what can someone who doesn't know me do?* (1, SA, PO (FT), AP, 5)

In other cases, when participants told their confidant about how their CSI impacted them, they

would diminish their experience. This was particularly prominent in disclosures of depression

and anxiety. In another disclosure to a roommate, one Participant said:

> *I do have depression. I know it's kind of common and it kind of seems like it's not that big of a deal, but for me it's pretty severe, especially now that I'm in school again cause there's a lot more to deal with and worry about…. I don't really get out a whole lot and go and try to make friends so, I mean, I don't ever really talk to people outside of my small group of friends that I've had since high school* (9, MH, CO (RM), AV, 5).

Despite the impact that this participant's depression diagnosis has had on her life, she

minimized her CSI by stating that it is a common experience.

When another Participant disclosed his social anxiety to a previous teacher, he said, *"I've*

been stuck with acute social anxiety for a while now. And it seems like a poor excuse but for

me it very detrimentally affects my work. Um, when you assigned group work, I internally

panicked" (11, MH, PO (FT), AP, 4). Similar to the previous example, this Participant also

minimized his identity, suggesting that some people who live with a CSI, particularly a mental

health disorder, may internalize the identity-related stereotypes associated with their diagnosis

and feel the need to justify their behaviours via disclosure of their identity.

Reasons for Disclosure and Concealment

In addition to providing identity information about their CSI, some participants chose to

explain why they have not previously disclosed their identity and why they were sharing this

information now. Disclosing a CSI can be a lifelong process for individuals living with a hidden

stigma. Active disclosure and concealment is a continuous process in which people make

decisions regarding who to share their identities with based on the level of social support they anticipate and internalized shame (Quinn & Earnshaw, 2013), fear of negative reactions (Chaudoir & Quinn, 2010), and relationship intimacy (Green, Derlega, & Matthews, 2006). In some cases, these decisions were described by participants in their role-played disclosures.

Reasons for concealment: Fear of disclosure. Notably, participants shared that their reason for previous non-disclosure was due to the fear associated with disclosure outcomes (10 CO and 8 PO). For some, the decision to conceal their identity was made after becoming privy to their chosen confidant's negative attitudes towards other people who share the same identity. This fear of disclosure reflects the avoidance motivation of reducing negative outcomes. Though approach and avoidance motivation can be manipulated (Elliot & Harackiewicz, 1996), the manipulation does not negate the already expressed negative attitudes of a chosen confidant. As such, the fear of disclosure theme was present in both approach and avoidance disclosures. For example, one Participant who was instructed for approach motivation described how he actively concealed his identity from his grandfather after this confidant vocalized negative attitudes towards homosexuality:

> *The world has evolved rapidly since the days when you were my age and*
> *people are working harder than ever to be considered equal to each other.*
> *This is why I want to tell you that I'm gay. I have spent my whole life trying*
> *to hide this from you as I have specifically heard you refer to homosexuality*
> *in the past with an extremely negative tone* (3, GSM, CO (F), AP, 1).

In this case, the participant acknowledged the negative attitudes that his grandfather has and suggested that this is the result of his grandfather's upbringing. This excerpt demonstrates the dilemma that many individuals who live with a CSI experience within their personal relationships, and their attempts to avoid a negative reaction. While this participant expressed the desire to share that he is gay due to the strides made by the LGBTQIA+ community, he still provided justification for his disclosure confidant's negative attitudes by stating, "I know you to be of a different time." This further suggests that he may have wanted to make his

grandfather comfortable, while still being honest about his identity. This careful consideration of the confidant highlights that disclosing a CSI does not only impact the discloser, but the relationship as a whole.

Other participants discussed their fear of disclosure through internalized shame and stigmatization. Many people with CSIs are aware of, and may even endorse the negative stereotypes associated with their identity. This internalization and anticipation of negative stereotypes can serve to legitimize their perceived lower status and motivate people to take measures to conceal their identities (Quinn & Earnshaw, 2011). As one Participant said:

> *I don't like telling people this a lot because it seems very petty, like moody teenagers. Like that's everyone. Everyone gets depressed, everyone feels awkward sometimes, but for me it's not menial and I feel like if I tell a lot of people they're just going to think less of me so he this is not a big deal and he's making it a big deal. But it's a big part of who I am so I don't like to tell people* (11, MH, CO (FR), AP, 5).

This participant demonstrated the harmful stereotypes associated with depression—namely that people who are depressed are over-reacting. Further, this participant highlighted that the anticipated stigmatization, along with his identity centrality, compounded the fear of disclosure by stating, "But it's a big part of who I am so I don't like to tell people."

Other participants were more direct in expressing that their knowledge of broader, societal stigmas kept them from disclosing. For example:

> *I've always been a reliable person at work and I will continue to be a reliable person at work. I just keep this secret to myself because of the stigma associated with mental illnesses and how people view them in society* (30, MH, PO (B), AV, 4).

The ubiquity of negative stereotypes and beliefs about concealable stigmas not only contributes to a fear of negative outcomes following disclosure to specific confidants, but a more general desire to conceal overall.

Reason for disclosure: Strengthen relationship. While some participants explained why they had not shared their identity before due to fear for how the confidant would react,

others expressed their desire to disclose in order to build and strengthen their relationship with the confidant ($n = 9$ CO; $n = 12$ PO). Though this theme was represented equally regardless of motivation ($n = 10$ AP; $n = 11$ AV), this represents the underlying approach motivation of achieving a positive disclosure outcome. Self-disclosure in general is a crucial part of relationship development, and sharing deeply personal information and experiences helps to build trust and understanding. However, disclosing a CSI too soon within an interpersonal relationship may be seen as inappropriate, while waiting too long can cause the confidant to feel they were being lied to (Greene, Derlega, & Matthews, 2006). Therefore, many participants specifically noted that it was the appropriate time to share their CSI with a Participant telling their significant other:

> *I've felt that connection that we had and you've always been open and honest with me about everything. So, I guess now I feel like it's the proper time to tell you something that I've kind of been keeping from you for various reasons. Um, when I was about 13, I started self-harming and experiencing depressive symptoms* (21, MH, CO (SO), AP, 5).

Similarly, other participants expressed that they wanted to disclose in order to strengthen an already robust relationship, "*You mean the world to me in such a short amount of time. And our friendship is something I want to last an even longer amount of time. To do that, there needs to be no secrets between us*" (29, MH, CO (FR), AP).

Along with the explicit purpose of strengthening an existing relationship, some participants noted that their disclosure confidant had shared personal information about themselves, and they wished to reciprocate:

> *I feel bad about not telling you this before, but I thought now that we're a lot closer as friends I should tell you, especially since you've been so honest with me lately* (18, MH, CO (FR), AP, 5).

> *I just want you to know a little more about me just because I feel like I know more about you—a lot more about you than you know about me* (24, GSM, PO (B), AV, 5).

Likewise, participants expressed a desire to strengthen a relationship in a professional setting, however, this goal was occasionally intended to shift the nature of a relationship from strictly professional to more personal. For example, when disclosing an experience of sexual abuse, a Participant said, "*So, I just want you to know a little bit about my past because I want you to understand me in a different way. Um, you know me as the athlete and I want you to know me more as the person*" (4, SA, PO (SC), AP, 5).

However, others expressed their desire to improve the relationship with their confidant. By disclosing their CSI, a few participants suggested that they may strengthen a negative relationship by encouraging a deeper understanding of each other. It is important to note that the desire to strengthen a volatile relationship was only endorsed by participants disclosing to a family member:

> *I want you to grasp the concept, and I want you to understand me. We don't have the best relationship. And I hope by telling you this it might lead you to understand me a little better* (23, GSM, CO (F), AV, 3)

> *I'm telling you with the intention of strengthening our relationship which has not always been the best in my adulthood* (3, GSM, CO (F), AP, 1).

These results suggest that disclosure towards those who have expressed negative attitudes as well as active concealment might be most salient within the family domain.

Reason for disclosure: Live true self. While relatively few participants (*n* = 4 CO; *n* = 6 PO) expressed a desire to live a more self-affirmed life compared to strengthening a relationship, this desire was only expressed by participants who disclosed a gender or sexual minority identity. Participants who explained their reason for disclosure in an effort to live true to self typically did so in order to avoid the burden of hiding. One Participant described this reason for sharing succinctly when she disclosed her pansexual identity to her mother:

> *Um, I didn't really want to make a big deal of it so I didn't talk about it, but recently I've felt like I'm hiding parts of myself, like I'm censoring myself and parts of my life, and I feel like you've noticed it too....I'm not currently dating anyone, but on the off-chance that I do, I don't want to have to hide it or act*

> *like I'm ashamed of my partner or worry about which pronouns I'm using*
> (27, GSM, CO (F), AV, 4).

This participant described the cognitive load associated with "censoring" an important part of herself to a CO. Similarly, another Participant said:

> *I'm nervous that if I don't hide the true nature of our [same sex] relationship you may think less of me. I avoid this anxiety against my desire to exist openly as myself in my work environment and I've decided that I would rather you just know this personal quality of mine…. Understand that me telling you this is only because I want to function to the best of my ability in my workplace and will be able to do so when I am comfortable being who I am at all times*
> (3, GSM, PO (B), AP, 4).

These participants highlighted how hiding their sexual identity caused an additional burden to both close relationships and professional ones. While the cognitive load associated with concealing a CSI exists for all identity types, this discrepancy between social and actual identity appears to be most salient for gender and sexual minorities.

Anticipated Response of Confidant

Given that positive social support is one of the most important predictors of post-disclosure well-being, individuals living with CSIs must be able to anticipate the reactions of others in real and imagined situations. Although only 11 out of 66 disclosures ($n = 8$ CO; $n = 3$ PO) endorsed the anticipated response theme, these instances stood out as they most frequently suggested a negative response by the confidant, particularly to close others. For example, when a Participant disclosed that he is questioning his sexual orientation to a professor, he did not expect a negative reaction saying, "*I don't really see you having much of a problem with this because I imagine you've seen more people who are homosexual, bisexual, trans, basically more people than I'll probably ever meet*" (22, GSM, PO (P), AP, 4). However, when he disclosed to his best friend, he said, "*I don't know why this is so hard to talk about. I should be able to trust you. I should be able to rely on you not to shun me, but I have a feeling that you would*" (22, GSM, CO (FR), AP, 4).

Another Participant, on the other hand, expected her mom to feel upset and "heartbroken" if she disclosed her previous experience of self-injury. She said in the beginning of her disclosure, "*The summer before my senior year I would cut myself. Please, I know what you're thinking right now, and please, just let me explain.*" After describing the circumstances which led to her self-injury, she said, "*I've gotten stronger and I've grown so much since my past…. I know that it's still heart-breaking to hear but what's past is the past. I'm so sorry to have to put this on you now*" (20, SI, CO (F), AV, 4). In this case, the participant was most concerned about the emotional burden her disclosure would have on her mother. This is consistent with recent work investigating reasons for disclosing nonsuicidal self-injury that found that people chose to actively conceal to protect their friends and family from the emotional burden of such disclosures (Rosenrot & Lewis, 2018).

Inter-Personal Post Disclosure Goals

In this sample, 28 out of 33 participants described their post disclosure goals to at least one of their chosen confidants in their simulated disclosures (*n* = 23 CO; *n* = 20 PO). This is a crucial aspect of the disclosure event given that perceived social support following a disclosure is associated with greater well-being (Beals et al., 2009). Three participants disclosing to PO confidants described specific goals for their disclosure. For example, a Participant shared with their co-worker that they are disclosing in order to be referred to with gender neutral pronouns:

> *I would like to request that you use gender neutral language when referring to me. While I'm used to people using female pronouns, 'she' and 'her', and they do not bother me, I'd rather people start using 'them' and 'they' as it makes me feel a bit more comfortable* (23, GSM, PO (C), AV, 3).

Similarly, when another Participant disclosed her experience with intimate partner violence to her boss, she requested that she not be asked to serve the perpetrator if he were to come into the restaurant:

> *I would hope that you and the rest of my co-workers can understand that if he would ever come to the store, I would not be able to serve him, I cannot even look at him without having a panic attack. I hope that with just one or*

> *two words, you and the rest of my co-workers would allow me to leave the situation and not have to serve him* (19, SA, PO (B), AV, 5).

These Participants described a direct plan of action for the professional environment following a disclosure. More frequently, however, participants suggested broader aims for social support following the disclosure event. As an example, a Participant, in sharing her depression with a friend, stated:

> *I wanted to let you know this secret because we've been friends for so long and it would be such a relief for me to tell you and to have your support….So in the future, I really hope that we can be able to talk to each other or if you're ever feeling sad we have that deeper understanding* (6, MH, CO (FR), AV, 5).

In this case, the participant shared that she valued their friendship, and through disclosure, directly solicited social support and offered to mutually support their friend.

Whereas the previous Participant sought support from her friend, another asked his CO to simply understand how his mental health impacts his behaviour, "I *hope that you understand now, I know you can still be pissed off that I lied to you, but I hope you understand why and I hope that you come to me with stuff like this too*" (11, MH, CO (FR), AP, 5). This participant was not asking the confidant to change their feelings regarding his behaviour, rather, he was opening up the channels of communication, encouraging the confidant to share any experiences or secrets he may also be living with.

Along with encouraging mutual disclosure, some participants invited their confidant to ask questions and have a discussion regarding their CSI. As an example, when one Participant, disclosed to his professor that he is questioning his sexual identity, he said, "*This must be pretty awkward for you but, you know, if you've got any questions, or if you have any advice, please let me know. And uh, let's get back to work*" (22, GSM, PO (P), AP, 4). Furthermore, another Participant, requested that her friend help others understand her more after disclosing her experience with trichotillomania:

> *I just hope that you'll be more understanding than most. Um, and that now that you're educated on my issue, you'll be there in my defence when people try to ask, you know, ask me questions, you're not questioning with them…. Like when they come to you with questions about me, and you can educate them on why I wear wigs and wear weaves because it's been hard* (29, MH, FR, AP, 5).

Similar to the results of sexual assault disclosures on Reddit, we found that, in a simulated interpersonal disclosure, participants stated their hope for social support following the disclosure event.

Discussion

Through a qualitative analysis of simulated CSI disclosures, we examined how people disclose a concealable stigmatized identity to both close-other (e.g., family members, friends) and professional-other (e.g., co-workers, employers) confidants. Although the DPM suggests that disclosure context and antecedent goals may impact the depth, breadth, and duration of a disclosure event, little is yet known about the content of people's disclosures when they reveal a CSI (Chaudoir & Fisher, 2010). Our analysis of the simulated disclosures revealed that participants shared *identity specific information, reasons for previous concealment and current disclosure, anticipated response of the confidant,* and *interpersonal post-disclosure goals*. The qualitative analysis employed in this study allowed for a greater depth of information on why people with different CSIs may want to disclose to COs and POs and/or why they have previously concealed their identities.

For the majority of CO and PO disclosures (86.36%), revelations were relatively straightforward with participants explicitly stating their identity. Conversely, a few participants hinted at their CSI through an implicit disclosure. While there seemed to be no consistent confidant or identity type which elicited an implicit disclosure, all participants but one were in the avoidance condition. As proposed in the DPM, antecedent goals influence the content of a disclosure including the breadth and depth of information (Chaudoir & Fisher, 2010). The few participants instructed with avoidance motivation who implied their identities may have done

so in an effort to distance themselves from the identity. Because the potential for negative outcomes (e.g. stigmatization) are particularly salient in avoidance-motivated disclosures, participants here may be internalising the stigma resulting in a rejection or distancing of the self from the identity. Although people may distance themselves from their identity in an attempt to reduce stigmatization, this process is often associated with greater psychological distress (Quinn et al., 2014).

Though identity disclosure is often considered favourable, recent research demonstrated that sexual minority individuals experience greater well-being if they varied in their degree of disclosure across life domains (Legate, Ryan, & Rogge, 2017). While the majority of participants who provided implicit disclosures were in the avoidance condition, it is still unclear from these results if the implicit disclosure reflects the anxiety associated with fear of negative outcomes, or perhaps more flexibility in their disclosure decisions. Therefore, these results partially address research question 2 as there is some evidence that motivational instruction did lead to more implicit disclosures in the avoidance condition. Future research should examine the function of implicit disclosure or signalling behaviours—such as displaying a pride flag—on psychological well-being and interpersonal disclosure outcomes, particularly when avoidance motivational systems are activated.

Despite the ability to hide a CSI, such identities and experiences are incredibly influential, nonetheless. As such, participants discussed the impact that their CSI has on their daily lives to provide a deeper understanding to their confidant regarding what it is like to live with that particular identity. This was particularly salient for people who experienced sexual violence such that participants who disclosed sexual assault shared that forming close relationships with others remained difficult, even years after the abuse stopped. Recent work by O'Callaghan, Shepp, Ullman, and Kirkner (2019) analysing the impact of a sexual assault

disclosure in personal and romantic relationships found that, following a disclosure, the romantic relationship often changed in both physical and emotional intimacy.

Participants who disclosed a mental health disorder were more likely to discuss the impact it has on their lives in order to justify or explain their behaviour. By describing how their mental health disorder impacts them, and the severity of their symptoms, our participants attempt to justify to their chosen confidant that their disorder is real. As Jones and colleagues (1984) suggested, both *origin* and *course* of a stigma impact how those with a CSI are perceived. For people with a mental health disorder, when a confidant assumes more controllability over mental health symptoms, people generally exhibit less sympathy and willingness to provide support (Collins, 1994; Muschetto & Siegel, 2019). Therefore, when disclosing a mental illness, individuals may try to justify their symptoms and behaviours to their confidant to reduce stigmatization. Future research should specifically examine how people living with a mental illness express the controllability of their symptoms to different disclosure confidants.

Unexpectedly, many participants explained why they had not disclosed previously. Because the process of revealing personal information about oneself is continuous, and there are risks associated with concealable stigma disclosure, people make intentional decisions regarding who to share this information with. Similar to an analysis of sexual assault disclosures on Reddit subforums, participants shared their reasons for both prior concealment and present disclosure to their imagined other (Andalibi et al., 2016). Interestingly, whereas Andalibi and colleagues (2016) found that individuals discussed negative previous disclosure experiences online, participants in the present study did not share their previous disclosure experiences with their chosen confidant. This may reflect the different function of online versus dyadic disclosure whereby the aim of sharing a CSI with a specific confidant is to build an

interpersonal relationship, while online spaces allow an individual to write out and share their general experiences.

For some, the decision to conceal was clear: their chosen confidant had previously demonstrated negative attitudes toward their specific stigmatized group. In these cases, participants acknowledged their confidant's attitudes and highlighted that they do not intend to change the other person's opinion. This may reflect ecosystem motivations for the disclosure, where an individual considers their own needs along with the needs of their confidant (Garcia & Crocker, 2008). These motivations may be most salient in the context of familial relationships in which clear lines are drawn and roles are defined (e.g., grandfather and grandson). Though there is evidence that suggests ecosystem disclosure motivation is associated with more positive first-time disclosure experiences (Chaudoir & Quinn, 2010), more frequent disclosures, and greater psychological well-being (Garcia & Crocker, 2008), there is little understanding regarding the association between relationship type and ecosystem/egosystem motivations on the disclosure experience. Therefore, future work should address the function of eco- and egosystem motivations across life domains.

Perhaps the most established motivation for self-disclosure, is to strengthen interpersonal relationships (Canevello & Crocker, 2010). Therefore, it is interesting that relatively more participants who expressly endorsed this reason for disclosure did so to professional other confidants ($n = 12$) compared to close other confidants ($n = 9$). When participants disclosed to a PO, they expressed a desire to shift the relationship from professional to more personal. In line with previous research that suggests individuals are more likely to disclose in a supportive work environment (Wessel, 2017), 90% of chosen PO confidants were rated as being either *somewhat supportive* or *very supportive*. Therefore, future research should examine the structural and interpersonal outcomes of shifting professional relationships following a CSI disclosure, particularly when a supportive response is not expected.

Chapter 2: Content of Concealable Stigma Disclosure

Whereas participants expressed a desire to shift the nature of a professional relationship to more personal, participants disclosing to close others, particularly family members, hoped to improve a relationship that was not strong. Perhaps these results reflect the risks associated with disclosing to family members, where negative reactions have the potential to irrevocably impact the existing family dynamic. Though there is evidence that people living with a CSI tend to have lower job satisfaction when actively concealing (Prati & Pietrantoni, 2014) and reduced likelihood of reemployment following disclosure (Rüsch et al., 2018), these risks may not be as salient compared to the potential negative consequences of disclosing to someone with whom you already have a close relationship. In such relationships, concealing central information can often be seen as dishonest and hurt the bond (Greene et al., 2006). Although Ragins (2008) suggested that disclosure disconnects across life domains can lead to psychological distress, it may, in fact, reflect the necessary flexibility of disclosure decisions resulting in more perceived autonomy over self-disclosure (Legate et al., 2017).

In line with existing models of the disclosure process (see Chaudoir & Fisher, 2010; Jones & King, 2014; Pachankis, 2007 for examples of concealable stigma disclosure models) which incorporate anticipated interpersonal or organisational response to varying degrees, participants in 11 disclosures revealed how they expected their confidant to react. Interestingly, this theme was only represented in three PO disclosures, all of which predicted a positive outcome. Therefore, while some participants chose close others as their disclosure confidant, despite anticipating a negative reaction, it may be the case that individuals have no motivation to disclose in an unsupportive professional environment.

Finally, addressing research question 3, the majority of participants shared how their confidant can support them going forward in at least one of their simulated disclosures. While only three participants described concrete goals such as asking their confidant to use certain pronouns, participants were more likely to provide broad, long-term desire for social support.

Further, some participants opened the door for their confidant to disclose as well, highlighting the typically reciprocal nature of self-disclosure (Sprecher, Treger, Wondra, Hilaire, & Wallpe, 2013). Participants sought and offered emotional and social support across relationship domains regardless of antecedent goals. These results may reflect ecosystem motivations for disclosing a CSI. Because ecosystem goals in relationships are associated with enhanced well-being and feelings of closeness (Crocker, Garcia, & Nuer, 2008), it is important for researchers to better understand how these motivations are perceived by the confidant. Furthermore, when individuals express the type of support they hope to receive, there may be less likelihood of a mismatch between expected support and received support following a disclosure. Future research should aim to characterise how people ask for support following a disclosure, the type of social support they desire, and the type of support received.

Study Limitations and Implications

In this study, we examined disclosures across a wide-variety CSI identity types including sexual and gender minority identity, mental health diagnosis, sexual violence experience, history of eating disorders, and non-suicidal self-injury to capture the stigma disclosure experience broadly. Although there were many overlaps between each identity in the content of a simulated disclosure, these data do not necessarily speak to the specific experience of disclosing unique stigma types. Given that CSIs vary greatly in their social stigmatization, course, concealability, and long-term psychological consequences (Jones et al., 1984), we would benefit from a deeper understanding of how people share specific concealable stigma types.

Further, because we used convenience sampling recruitment methods, these data may reflect how individuals with a CSI who are mostly white, female-identifying, and college-educated disclose to the people in their lives. Moreover, the participants in this study had very different disclosure histories, with some participants having shared their identity to many

people, and some who had not told anyone at all. Finally, participants were asked to think of someone they have not told, but would like to tell share their identity with. As such, the majority of participants anticipated high levels of social support from their chosen confidant. In future work using similar methods, researchers should instruct participants to consider a disclosure confidant where there is ambiguity about the confidant's response, or where a negative response is anticipated. Altogether, future research should aim to understand how people of different cultural, educational, and previous disclosure backgrounds share their identities, particularly when anticipated social support is low.

An additional limitation lies in the nature of the disclosure itself. Self-disclosure is considered an interpersonal phenomenon with at least two co-acting individuals. In this study, participants simulated a disclosure event with an imagined confidant. While this exercise has proved useful in psychological research and clinical settings (Rodriguez & Kelly, 2006), it is devoid of important information such as the confidant's nonverbal behaviours. Despite these limitations, this research provides a useful framework within which to understand how people share stigmatizing identities. Future research can employ similar methodologies to better understand the disclosure experience for clinical and applied purposes.

Conclusion

This research is the first to employ a simulated interaction to capture a CSI disclosure event. These results elucidate some of the qualitative differences in concealable stigma disclosure when sharing in both close relationships and professional relationships. Taken together, these data suggest that disclosing a CSI to a close-other represents greater potential risk compared to professional-other when anticipated social support is high. Participants gave more reasons for prior concealment and more predicted responses to a close other compared to professional confidants. Moreover, participants instructed for avoidance goals were more likely to implicitly disclose their identity, compared to approach motivation. Importantly, other

than the identity related information, all of the themes discussed herein directly relate not just to the identity, but to the relationship itself. From explaining why the participant had not disclosed to their confidant previously, to describing inter-personal post disclosure goals, all of the simulated CSI disclosures addressed the confidant directly. Therefore, this research is an important first step to knowing what people say when they share a hidden stigma to people across their life domains.

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Chapter 2: Content of Concealable Stigma Disclosure

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Supplementary Material

Table S1. Demographic information for each CSI type represented in this sample.

CSI type	Gender Identification			Race Identification			Age
	Male	Female	Nonbinary	White	Black	Asian/Pacific Islander	*M (SD)*
Sexual Assault Experience	-	5	-	5	-	-	19.4 (1.52)
Gender and Sexual Minority	3	3	2	7	1	-	21.63 (4.63)
Mental Health Disorder	2	9	-	9	1	1	20 (3.38)
Exotic Dance Work	-	2	-	2	-	-	24 (5.66)
Maternal Emotional Abuse	-	1	-	1	-	-	20 (-)
Self-Harm	-	1	-	1	-	-	18 (-)
Eating Disorder	-	1	-	-	1	-	18 (-)
Self-Harm and Eating Disorder	-	2	-	1	-	1	18.5 (0.71)
Mental Health Disorder and Self-Harm	-	2	-	2	-	-	20 (1.41)

Table S2. Coding dictionary and example excerpts for each subtheme.

Superordinate Theme	Subtheme	Example
Reason for Disclosure/Concealment		
Disclosure	Live true self	"Understand that me telling you this is only because I want be… uh I want to function to the best of my ability in my workplace and will be able to do so when I am comfortable being who I am at all times."
	Strengthen relationship	"I know we've gotten along really close at work in the past and I hope that this like brings us closer"
	Explain behaviours	"I know that you've asked me before why I'll just randomly leave if you're in a big group of people like socializing or whatever or why I'll just not text you for days at a time. And I've made excuses for why. I've tried to explain why before but those really were just excuses and I'm sorry that's that's lying but I think you need to understand why I lied about that and the real reasoning isn't something that I like to talk about."
Concealment	Fear of disclosure	"I'm scared to like open up to people and that's why I never told you this and why you always ask me, that you don't understand me. This is why you don't understand me."
Identity Information	Identity disclosure (implicit and explicit)	"Well since 5th grade I have been struggling with self-harm and an eating disorder um and suicidal thoughts and attempts." Explicit "Most days when we hung out alone, he would ask me to do things and when I was reluctant, he got angry and made me feel guilty for not complying with what he wanted." Implicit
	Acquisition and trajectory	"Today I'm doing fine. It took me four years but my medicine is working and I'm going to college."
	Impact of identity on daily life	"I cannot even look at him without having a panic attack."
Anticipated Response of Confidant		"I should be able to rely on you not to not to shun me but I have a feeling that you would."
Interpersonal Post Disclosure Goals		"And I hope that you can meet her and really love her like you love me."

Chapter 3: Embodiment of Concealable Stigma Disclosure

Addendum to Chapter 2

This first paper focused on the thematic content of a CSI disclosure towards close other and professional other confidants, following an approach or avoidance goal manipulation. Results of this commencing paper provide important context under which the entirety of this thesis can be read. The most noteworthy contribution of this paper is the detailed description of a disclosure event provided, the content of which has been difficult to capture given the feasibility and ethical considerations of conducting this work. Firstly, stigma disclosure generally arises from the interaction between many intrapersonal and relational factors, making it difficult to either capture naturalistically (with the exception of widespread public disclosure, see chapter 5), or manufacture experimentally with a dyad. Dyadic disclosure in a laboratory setting also has ethical implications as revealing a CSI opens the possibility for individuals to experience discrimination by their study partner (this is addressed with confederate methods in chapter 4). Therefore, the overall motivation of this methodology was to record an ecologically valid disclosure simulation in a controlled experimental environment by asking participants to imagine the conversation, while disclosing in a safe setting. This was achieved as many of the participants in this study directly addressed their confidant. In one example, the Participant set the imagined scene as being set outside of the lab, he said:

> *Um, I want to go to the family room in order to tell you this so, can you*
> *just sit right there on the um, on the fireplace.*

Though not prompted, this participant imagined both his disclosure confidant, and the setting in which he wanted to disclose. Future work can incorporate the imagined setting when employing similar methodology.

The results of this study look at the disclosure event with a wide lens; though differences in content were demonstrated as a function of relationship context, antecedent goals, and identity type, the crux of this work lies in describing the similar experience of making oneself open to stigmatization or rejection through the disclosure of a CSI. The

following papers presented in this thesis are a step removed from the actuality of a disclosure, therefore, in reading the entirety of this thesis, the vulnerability and strength of the participants should be considered. The next paper presented in chapter 3 describes the behavioural dynamics (both postural activity and word use) during the disclosures reported in this chapter. Whereas paper I highlighted the actual content of a disclosure event, paper II considers the unintentional and nonverbal information implicitly conveyed during a disclosure toward close other and professional other confidants, utilizing either approach or avoidance goals. Chapters 2 and 3 are part of the same study, therefore there is some methodological overlap. Note that this manuscript was prepared for submission to *Nature Scientific Reports*, therefore it follows a different structure relative to the other papers in this thesis. The sections are presented as follows: Introduction, Results, Conclusion, Method.

Chapter 3

Embodiment of concealable stigma disclosure through dynamics of movement and language

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H.D., S.F-H., S.C., M.R., and R.K. conceived of the research idea. H.D. and R.K. designed the experiment and H.D. collected data. H.D. and M.R. conducted postural and language analyses. H.D. interpreted the results and prepared a draft of the manuscript. M.R. prepared figures 4, 5, and 6.S.F-H, S.C., M.R., and R.K., edited and revised the manuscript prior to submission.

Chapter 3: Embodiment of Concealable Stigma Disclosure

Abstract: A concealable stigmatized identity (CSI) is any identity that can be hidden but, if revealed, is socially devaluing (e.g., gender or sexual minority identity). Individuals living with a CSI have opportunities to disclose to friends and family members, or within professional contexts. According to the disclosure processes model, people adopt either approach-oriented or avoidance-oriented goals when making such disclosures. The current study sought to identify how antecedent goals and relationship context are embodied in the dynamics of unintentional behaviours during disclosure. Participants simulated a disclosure event to both close other and professional other targets and were instructed for approach or avoidance motivations. Postural activity and language were analysed using detrended fluctuation analysis and recurrence quantification analysis. Results revealed that the movement dynamics of participants who were motivated by approach goals exhibited more complex and flexible behaviour compared to those who were motivated by avoidance goals. In addition, there was more recurrent word use towards close others compared to professional others. These results support the supposition of the disclosure processes model that approach-avoidance motivation impacts behaviour and sheds light on the functional differences between relationship contexts on a CSI disclosure experience.

Keywords: Concealable Stigma Disclosure, Embodiment, Approach-Avoidance Motivation, Nonlinear Dynamics

Chapter 3: Embodiment of Concealable Stigma Disclosure

Introduction

Individuals living with a concealable stigmatized identity (CSI) such as a mental health disorder, gender or sexual minority (GSM) identity, or history of sexual victimization are faced with decisions regarding when and to whom to reveal their identities. Unlike visible stigmas such as race and gender, which are often readily available to a perceiver, people living with a CSI make decisions how and when they reveal their hidden social stigma (Goffman, 1963; Jones et al., 1984). While such identities vary greatly in their acquisition and impact on daily life, individuals with concealable stigmas regularly encounter decisions about whether and how to disclose their CSI while also avoiding discrimination or harassment from friends, family, bosses, or co-workers (Chaudoir & Fisher, 2010). Though decades of research have demonstrated the positive health and psychological outcomes of experiencing social support following a disclosure (Quinn & Earnshaw, 2013), little is known about characteristics of a positive disclosure event, and the subtle information that an individual might reveal through unintentional behaviours such as posture. The present study sought to understand how these decisions—what to share and with whom—as well as a person's motivational state are embodied in movement and language dynamics during a disclosure. Further, this research aimed to develop an ecologically valid method to capture this process in a laboratory setting.

Unfortunately, investigating CSI disclosure in real time has proven difficult, both practically and ethically. Researchers often rely on the self-reported recall of previous disclosures (e.g., Chaudoir & Quinn, 2010). As such, this project took a novel approach by simulating a role-played disclosure event to capture the behaviours in real time. In the current study, we examined the dynamics of movement behaviour and language exhibited when revealing a CSI to a close other (i.e., friend or family member) and a professional other (i.e., professor, boss, or co-worker). More specifically, we explored how someone's motivation and relationship context are embodied within an individual's movement and language dynamics to

better understand the disclosure event as a holistic, multi-modal process that not only includes the content of the disclosure, but postural information and word-use dynamics as well. Each of these behavioural modalities produce important verbal and non-verbal information that may be detected by the target of a disclosure and, thus, significantly impact the outcome of a disclosure event.

Movement Dynamics

One behavioural system of interest is postural activity. Postural sway is a ubiquitous phenomenon that all individuals exhibit unintentionally. These dynamic movement fluctuations serve an important function for balance following a perturbation (Era & Heikkinen, 1985; Uiga et al., 2020) and for exploring the information within an environment (Carpenter, Murnahgan, & Inglis, 2010). Traditionally, cognitive research has suggested this variability is a random outcome of a brain-body lag whereby the body must wait milliseconds for input from the brain, thus the lag results in a slight error (i.e., postural sway; Pellecchia, 2003). At first glance, postural variability does appear to fluctuate randomly over time. However, research has found that there is meaningful structure to postural movement dynamics which allows individuals to adapt to different personal and task relevant constraints that can exist across different time scales (see Balasubramaniam, Riley, & Turvey, 2000; Bardy, Oullier, Bootsma, & Stoffregen, 2007; Delignières, Torre, & Bernard, 2011; and Manor et al., 2010 for detailed description of postural and behavioural complexity).

An individual's postural movements provide a collective and embodied meter of the co-dependent non-verbal, cognitive, and linguistic processes that characterise face-to-face social interaction (Richardson, Dale, & Shockley, 2008; Shockley, Santana, & Fowler, 2003). For instance, research within human movement sciences demonstrates how changes in situational constraint and an individual's intentional state can significantly influence the structure of postural fluctuations within the time-evolving linguistic, perceptual, and social cognitive

behaviours that shape the dynamics of human motor and postural activity (Corell, 2008; Delignières, Fortes, & Ninot, 2004; Van Orden, Holden, & Turvey, 2003). This research also reveals how healthy and robust intra- and inter-personal movements are typically characterised by long-range correlated (i.e. complex fractal or pink noise) patterns of behavioural variance, with overly controlled movements exhibiting more deterministic patterns of behavioural fluctuation (Coey, Washburn, Hassebrock, & Richardson, 2016; Dotov, Bardy, & Dalla Bella, 2016; Van Orden, Kloos, & Wallot, 2011; Washburn et al., 2014). For example, drunkenness (Noda, Demura, Kitabayashi, & Imaoka, 2005), schizophrenia (Kent et al., 2012), age (Lin, Seol, Nussbaum, & Madigan, 2008), and movement disorders such as Parkinson's disease and Huntington's disease (Stylianou, McVey, Lyons, Pahwa, & Luchies, 2011) are all characterised by a change in postural complexity away from adaptive, fractal patterns of behavioural variability. A change in the structure and complexity of postural activity is not only associated with poor health, but can be impacted by increasingly difficult cognitive tasks (Riley, Baker, Schmit, & Weaver, 2005).

As an example, when participants were asked to stand on a raised platform that would move to disrupt their quiet stance, anxiety related to the perturbation was associated with decreased postural control as measured by the amplitude of postural movement (Johnson, Zaback, Tokuno, Carpenter, & Adkin, 2019). Paxton and Dale (2017), when examining synchrony between two participants engaged in either affiliative or argumentative conversation found that behavioural synchrony (measured by %REC—see method for description) of head movements decreased during argumentative conversation. Furthermore, when the participants were exposed to a dual task in which they were asked to remember distracting stimuli, the dyad exhibited clear leader-follower dynamics compared to a control noise condition. The growing literature of movement and interaction dynamics suggest the importance of situational context on human behaviour (Eiler, Kallen, & Richardson, 2017). Therefore, the current study was

designed to investigate the dynamics of postural behaviour when participants disclosed a CSI to an imagined close other (CO) or professional other (PO) and instructed for either achieving positive (approach) or reducing negative (avoidance) disclosure goals. To do so, we measured postural behaviour in both the medio-lateral (ML; side-to-side movement) and anterior-posterior (AP; forward-backward movement) planes during the disclosure of a CSI to gain a better understanding of how mental processes and disclosure context are manifested in the bodies' relationship with the environment. It was expected that the postural signature would be more deterministic (i.e., less complex) and less adaptable during a PO disclosure, particularly when the motivation was to avoid a negative outcome.

Language Dynamics

In addition to nonverbal behaviour, we also explored the language dynamics of disclosure through the recurrent patterns of word use. Language is an incredibly powerful communicative phenomenon that underlies nearly all interpersonal communication. It is perhaps self-evident that the dynamic structure of linguistic information produced during a disclosure event would influence the disclosure and interpersonal outcomes. Considering the complex nature of word use in language, research has demonstrated the utility of studying dynamical properties of language during conversation (Dale & Spivey, 2006; Paxton, Dale, & Richardson, 2016; Romero, 2017; Vinson & Dale, 2016). Unlike time-series based measures (e.g., postural activity) which reflect continuous streams of information, word use, though still dynamical in nature, is best characterised as a discrete sequence of categorical events (Orsucci, Walter, Giuliani, Webber, & Zbilut, 1997). Recurrence analysis is a quantitative meter of how discrete word use may be used to characterise the complex structure of language. In an analysis of written essays, Allen, Likens, and McNamara (2017) found that the structure of word use, such as recurrence rate and longest line of recurrent words (Maxline), was significantly associated with the quality of the essays. In a recent exploratory analysis of an Expressive Writing

Intervention for women with Breast Cancer, results suggest that a change in the recurrent structure of the essays was associated with a decrease in depressive symptoms at 3 and 9 months, post-intervention (Lyby et al., 2019). To date, the majority of the work using recurrence analysis to describe the dynamic structure of language has examined written texts (Orsucci, et al., 1997) or recurrent behaviour in dyadic conversation (Dale & Spivey, 2006) Motivated by this existing research, we investigated the dynamics of word use by individuals during the simulated disclosure event, with the expectation that the dynamic structure of the linguistic utterances would also be modulated by the antecedent goals and relationship context of the disclosure event. However, given the nascent stage of this research program, these analyses are largely exploratory.

Disclosure Context

Research investigating the process of disclosing a CSI has made considerable advancement towards understanding motivations for disclosure, and how these decisions impact positive and negative outcomes such as social support, rejection, and psychological well-being (Chaudoir & Fisher, 2010; Matsumoto et al., 2017; Omarzu, 2000; Pachankis, 2007). Existing models highlight the importance of goal motivation prior to a disclosure event. Specifically, the Disclosure Processes Model (Chaudior & Fisher, 2010) argues that individuals share their CSIs using either approach-oriented goals (aimed at achieving positive outcomes such as increasing trust in a relationship) or avoidance-oriented goals (aimed at avoiding negative outcomes including rejection) and that activation of either motivational system has a meaningful impact on the disclosure event. For example, antecedent goals (i.e., approach/avoidance orientation) may influence the behavioural patterns that individuals exhibit when sharing hidden stigma such as language use and postural activity. Importantly, these subtle and often unintentional behavioural shifts can have a significant impact on the long term psychological and interpersonal outcomes of CSI disclosure, including the social support

a confidant provides and future disclosure decisions. The Disclosure Processes Model also predicts that approach-oriented disclosures are likely to exhibit behaviours, including both verbal and non-verbal, that elicit a more positive response from a confidant, whereas people who utilize more avoidance goals are not only less likely to disclose, but are more likely to experience negative outcomes when they do (Chaudoir, Fisher, & Simoni, 2011).

Research on approach and avoidance orientation is demonstrated in human and nonhuman animals to underlie many motivational processes (Elliot & Covington, 2001). This large body of research suggests that approach and avoidance motivational systems impact a number of outcomes including classroom performance (Elliot & Church, 1997), social and romantic relationships (Gable, 2006), therapy outcomes (Elliot & Church, 2002), and even perceptions of the environment (Strachman & Gable, 2006). Generally, approach motivational systems are activated to achieve positive outcomes and are associated with attuning to positive social and environmental stimuli. Conversely, avoidance motivational systems are activated to avoid negative outcomes and are associated with attuning to negative social and environmental stimuli (Strachman & Gable, 2006).

Along with the antecedent motivations behind revealing a concealable stigma, people living with a CSI make decisions regarding the type of information they share within their different relationships, such as sharing with friends and family, or in professional contexts. In fact, many people are motivated to keep the details of their CSI hidden from their co-workers, as revealing stigmatizing information can have a detrimental impact on their career path and job outcomes (Jones & King, 2014). Though all individuals with a CSI must consider the risks of disclosing against the potential intra- and interpersonal benefits (Pachankis, 2007), the additional emotional labour and impression management strategies that exist in a workplace context may impact the content of a disclosure as well as unintentional behaviours such as postural sway (Berkley, Beard, & Daus, 2019). Emotional labour is the emotion work required

within the parameters of one's job, such as maintaining emotional presentations desired by their organisation (Morris & Feldman, 1996). Therefore, individuals disclosing a CSI in a professional setting might be motivated to behave in a way that is congruent with the organisational context, even if it means portraying an inauthentic version of themselves (Berkley, Beard, & Daus, 2019).

Regardless of the potential for negative workplace outcomes following a CSI disclosure, sharing a concealable stigma in the workplace should not always be avoided. In fact, according to a 2000 report, it is estimated that up to 42% of individuals in the workforce live with a CSI (McNeil, 2000). With a large portion of the workforce continuously making decisions about the information they should reveal, it is apparent that a better understanding of the function of workplace disclosure is necessary. The existing research suggests that concealing one's identity can lead to a less cohesive workgroup (Chrobot-Mason, Button, DeClement, 2001). Conversely, gay men and lesbians who are open about their sexuality report greater job satisfaction (Day & Schoenrade, 1997), while concealment of a CSI can result in a stunted career path due to the social avoidance and isolation utilized to avoid unintentional disclosure (Croteau, Anderson, and VanderWal, 2008). A more recent investigation found that employees rated leaders who shared their transgender identities more positively compared to leaders whose transgender identities were unintentionally "found out" (Adams & Webster, 2017). However, despite the importance of understanding the characteristics of disclosures to professional-other confidants compared to close-others, almost no research has investigated such disclosure events, and of particular relevance here, whether the behaviours of CSI disclosures differ when revealing within a close-other or professional-other context. As such, this research also sought to investigate how antecedent goals and relational context might impact unintentional behaviours during a disclosure event.

Present Study

The current study examined a simulated disclosure event targeted to close others and professional others, and activated either approach or avoidance motivation in order to understand how these factors manifest in verbal and non-verbal behaviour. We expected that the intrapersonal motivations and relationship contexts (close vs. professional other) would impact the postural activity and language dynamics of individuals during the simulated disclosure event. More specifically, we hypothesized that participants in the avoidance condition would exhibit more rigid, deterministic behaviour compared to those in the approach condition, particularly when disclosing to a professional confidant. These results provide insight into the embodiment of meaningful cognitive and emotional states during high-stakes social interaction.

Results

Postural Movement Dynamics

Data treatment and analysis. During the simulated disclosure, anterior-posterior (AP; forward-backward) and medio-lateral (ML; side to side) movements were recorded via Polhemus motion capture sensors (FASTRAK, Polhemus, VT, USA) placed at the head and the waist (i.e., AP_{HEAD}, AP_{WAIST}, ML_{HEAD} and ML_{WAIST}). The same pattern of results for the movements recorded at the head and the waist were observed for AP and ML movements and therefore all measures were averaged across head and waist, with composite head/waist average values employed for hypothesis testing. Prior to this, all outliers 3 standard deviations above and below the mean were replaced with the mean value.

The dynamic structure of these movement time-series was determined using two different time-series analysis methods: *Detrended Fluctuation Analysis* (DFA) and *Recurrence Quantification Analysis* (RQA). These methods were employed because the postural activity of participants are non-stationary, exhibiting assorted structures of time-dependent variability

during the disclosure event. Both DFA and RQA are particularly well suited to the analysis of such data (Delignières et al., 2011; Eke et al., 2000; Richardson, Dale & Marsh, 2014; Riley, Balasubramaniam, & Turvey, 1999; Shockley et al., 2003; Webber, & Zbilut, 2005; Zhong, Yu, & Chen, 2017), as they are both capable of identifying the degree of persistent or recurrent structure entailed within highly variable behavioural time-series.

Detrended fluctuation analysis. DFA calculates the average magnitude of variance across a range of window sizes (e.g., 8, 16, 32… data points) and plots the average residual variance estimates as a function of window size. The slope of the regression line fitting the DFA plot provides an estimate of the fractal structure of the movement behaviour and is denoted by the parameter α (alpha). The a parameter, characterises the complexity of the behaviour such that $\alpha = 0.5$ reflects a random, non-correlated structure of movement variation, $\alpha = 1.0$ demonstrating moderately persistent, highly flexible behaviour, and $\alpha = 1.5$ demonstrating a highly persistent or overly controlled structure of movement (i.e., white noise, pink noise, and brown noise respectively). Given that postural activity is known to be characterised by moderately to highly diffuse pink or persistent 'Brownian' variation (i.e., fractional Brownian motion [FBM]) we expected $.9 < \alpha < 1.5$ in all conditions. Of particular interest, was the degree to which approach and avoidance goal motivations and target confidant modulated participant's postural activity within that range. That is, we were interested in examining the degree to which the postural activity exhibited by participants was more or less persistent (i.e., less "brown" and more "pink" *or* more "brown" and less "pink') across conditions (see the Method for a detailed description of DFA). The DFA procedure was conducted using the fractal analysis toolbox developed by Michael Richardson and colleagues (example code can be found here [https://github.com/xkiwilabs/MATLAB-Toolboxes/tree/master/Fractal_Analysis_Toolbox]) using MATLAB (R2017b) software.

Chapter 3: Embodiment of Concealable Stigma Disclosure

To determine the effects of the Goal Motivation (approach vs. avoidance) and Target on α_{FBM} (i.e., postural complexity), separate 2 × 2 (Target: close-other vs. professional-other) mixed designed ANOVAS were conducted for ML and AP movements using IBM SPSS (25.0.0.2) (Table 1). With regard to ML movements, this analysis revealed a main effect of condition ($F(1,38) = 6.37$, $p = .02$, $\eta_p^2 = .14$) such that participants instructed for approach motivation exhibited α_{FBM} representing more adaptive, pink motion ($M = 1.25$, $SD = 0.14$, 95% CI [1.21, 1.29]) while avoidance instruction elicited more deterministic, Brownian motion ($M = 1.33$, $SD = 0.14$, 95% CI [1.28, 1.37]). Further, there was a nonsignificant trend between motivation and disclosure target on postural activity dynamics ($F(1, 38) = 3.72$, $p = .06$, $\eta_p^2 = .09$). Simple effects analyses using pairwise comparisons with a Bonferroni correction were performed to probe the interaction. Results demonstrated that, during approach motivated disclosures, mean α_{FBM} values were closer to Brownian motion when disclosing to PO's compared to CO's ($M = 1.28$, $SD = 0.11$, 95% CI [1.19, 1.29]; and $M = 1.24$, $SD = 0.11$, 95% CI [1.22, 1.32] respectively; $p = .04$). There was no main effect of target ($F(1,38) = .26$ $p = .62$).

Finally, although there was no main effect of disclosure confidant and no significant interaction ($F < 2.84$, $p > .10$), there was a significant main effect of goal type on postural complexity in the AP direction ($F(1,38) = 4.04$, $p = .05$, $\eta_p^2 = .1$). In line with results of α_{FBM} in the ML plane, α_{FBM} was more persistent (more Brownian) during avoidance oriented disclosures ($M = 1.32$, $SD = .10$, 95% CI [1.28, 1.36]) compared to approach oriented disclosures ($M = 1.26$, $SD = .11$, 95% CI [1.22, 1.30]), suggesting that approach motivation (desire to achieve positive outcomes) elicits more flexible, adaptive behaviour compared to avoidance goals (see Figure 1).

Table 1. Test statistics for the α_{FBM} parameter.

	Main Effect Confidant		Main Effect Goal		Interaction	
	F	p	F	p	F	p
α_{FBM} AP	0.07	0.8	4.04	0.05	2.83	0.1
α_{FBM} ML	0.3	0.59	6.37	0.02	3.72	0.06
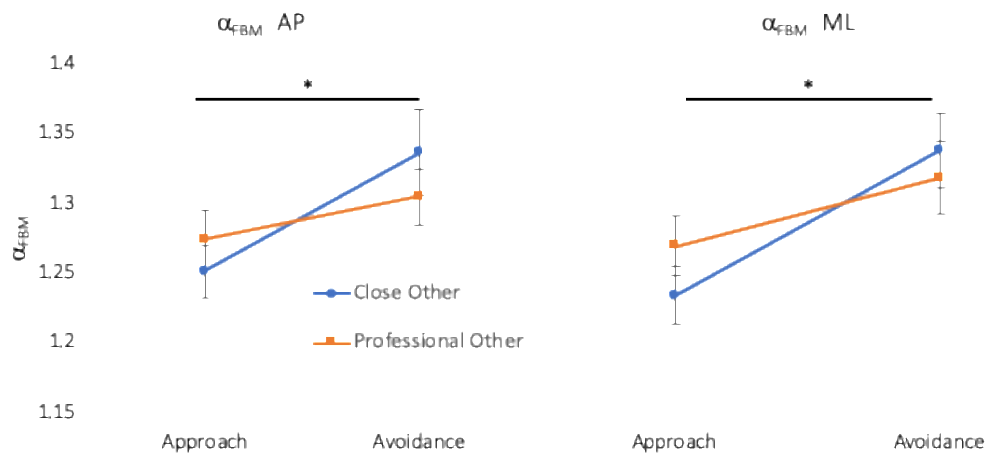
Figure 1. Mean α_{FBM} of postural activity in the anterior-posterior (AP) (*left*) and medio-lateral (ML) (*right*) directions. Horizontal lines represent the main effects of antecedent goals. * *p* < .05, ** *p* < .01.

Recurrence quantification analysis. In short, RQA determines the degree to which the states of a movement trajectory reoccurred over time. Of particular importance here, is that the analysis can be employed to index both the degree with which trajectory states reoccur over time (i.e., the percentage of recurrent states or %REC) and the maximal degree to which trajectory states follow the same sequence of states over time (i.e., the maximum length of recurrent state sequences, termed Maxline). With respect to the postural movement examined here, %REC provides an overall measure of the degree to which a participant revisited the same, or similar postural states during their simulated disclosure. Maxline is the longest sequence or line of recurrent points and as behavioural timeseries vary in length, is typically normalised with respect to the length of the analysed time-series (resulting in *proportional*

Maxline or *pMaxline)*. Essentially, pMaxline provides a general measure of behavioural stability, or the spatiotemporal determinism, of a movement time-series trajectory. As such, larger pMaxline is associated with more deterministic behaviour and less overall flexibility. (see the Method for a more detailed description of RQA). RQA was conducted using MATLAB code developed by Bruce Kay and Michael Richardson and colleagues. Example code and can be found here [https://github.com/xkiwilabs/MATLAB-Toolboxes/tree/master/RQAToolbox].

As with the DFA results, composite scores of the RQA statistics %REC and pMaxline averaged between the head and the waist are reported as they demonstrated the same pattern of results (Table 2). A 2 × 2 ANOVA conducted on %REC in the ML direction revealed no significant main effects, nor an interaction effect (all $F < 2.03$, $p > .16$). However, there was a significant main effect of disclosure confidant ($F(1, 38) = 11.65$, $p = .002$, $\eta_p^2 = .24$) on %REC in the AP direction, indicating that there was greater behavioural recurrence when disclosing to Cos ($M = 1.89$, $SD = 1.14$, 95% CI [1.53, 2.26]) compared to PO confidants ($M = 1.39$, $SD = 0.75$, 95% CI [1.14, 1.63]). There was no main effect of goal condition or significant interaction of %REC in the AP direction (all $F < 2.76$, $p > .11$).

The analysis of pMaxline for postural activity in the ML direction revealed a significant main effect of both goal instruction and disclosure confidant ($F(1, 38) = 5.87$, $p = .02$, $\eta_p^2 = .13$; and $F(1, 38) = 4.97$, $p = .03$, $\eta_p^2 = .12$ respectively). Further, results revealed a significant goal by disclosure confidant interaction, $F(1,38) = 5.88$, $p = .02$, $\eta_p^2 = .13$. Pairwise comparisons using a Bonferroni correction showed that, in the approach condition, pMaxline was significantly greater during PO disclosures ($M = .67$, $SD = .26$, 95% CI [.55, .79]) compared to CO disclosures ($M = .47$, $SD = .23$, 95% CI [.37, .58]) ($p = .001$), indicating that the postural activity of disclosures was more stable during PO disclosures compared to CO disclosures. In the AP plane, there was also a main effect of target ($F(1, 38) = 4.65$, $p = .04$, $\eta_p^2 = .11$) such that disclosures to PO confidants exhibited greater pMaxline ($M = .84$, $SD =$

.18, 95% CI [.78, .89]) and, thus more stable postural activity, compared to CO disclosures (M = .76, SD = .19, 95% CI [.70, .82]). There was no main effect of goal condition and no significant interaction of pMaxline in the AP plane (all $F < 1.0$, $p > .33$). See Figure 2 for all RQA results.

Table 2. Test statistics for all RQA parameters for postural dynamics.

	Main Effect Confidant		Main Effect Goal		Interaction	
	F	p	F	p	F	p
%REC AP	11.65	.002	0.22	.64	2.76	.11
%REC ML	2.03	.16	0.23	.66	0.14	.71
pMax AP	4.65	.04	0.08	.79	1	.33
pMax ML	4.97	.03	5.88	.02	5.16	.03
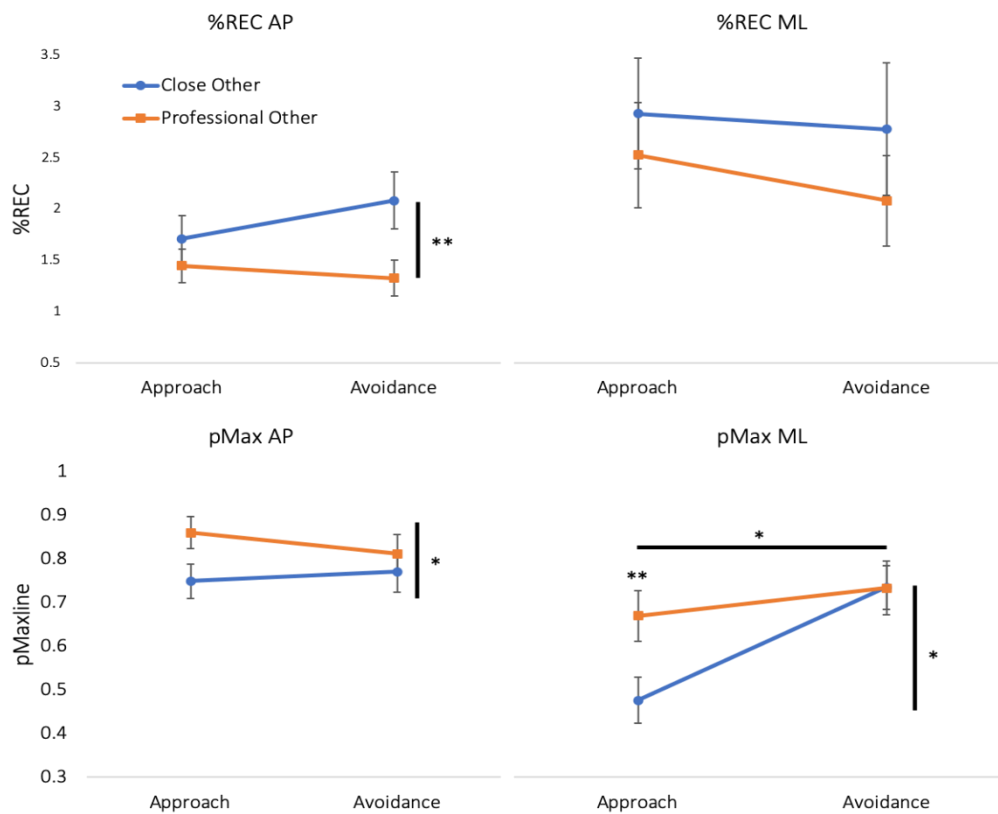
Figure 2. Mean %REC, and pMaxline of postural activity in the medio-lateral (ML) and anterior-posterior (AP) directions. (*top left*) Main effect of disclosure target on %REC of posture in AP plane. (*top right*) %REC of posture in ML plane. (*bottom left*) Main effect of pMaxline in AP plane. (*bottom right*) Interaction between target and motivation on pMaxline in ML plane. Vertical lines represent the main effects of disclosure target while horizontal lines represent the main effect of antecedent goals. * $p < .05$, ** $p < .01$.

Language Dynamics

The structural dynamics of the language participants used during the disclosure event were analysed using *Categorical RQA* or catRQA. Like RQA, catRQA quantifies the degree to which system states reoccur over time. However, it does so with respect to discrete or categorical states and, accordingly, can be employed to quantify the dynamics of verbal utterances by treating words spoken as discrete events (Allen et al., 2017; Dale & Spivey, 2006). Indeed, here the words in each transcription were coded as an integer number sequence, where each word in a transcript was represented by an integer value starting from word 1 to word *n* (i.e., 'I' = 1, 'need' = 2, 'to' = 3 … 'when' = 12.). From these categorical data series, catRQA was then employed to determine the *%REC and pMaxline* for each interval time series that resulted. With respect to language use, these two measures captured how often an individual re-used the same words (i.e., *word repetition*) and what the longest sequence of words that an individual repeated verbatim (i.e., *phrase [or sentence] repetition*), respectively. For a detailed description of this procedure, see the method section below.

Similar to the RQA analyses for postural activity, two 2 × 2 mixed ANOVAs were performed on %REC and pMaxline derived from categorical RQA (Table 3). Results revealed no significant main effects, nor an interaction for pMaxline (all *F* < .89, *p* > .35). There was, however, a significant main effect of disclosure target on %REC ($F(1, 31) = 4.45$, p = .04, η_p^2 = .13), with disclosures towards CO's defined by more recurrent (repetitive) language use (M = 1.56, SD = .31, 95% CI [1.45, 1.67]) compared to disclosures to PO confidants (M = 1.47, SD = .25, 95% CI [1.38, 1.56]). There was no significant main effect of goal motivation or interaction (all *F* < 1.41, *p* > .24; Figure 3).

Table 3. Test statistics for all RQA parameters for language dynamics.

	Main Effect Confidant		Main Effect Goal		Interaction	
	F	*p*	*F*	*p*	*F*	*p*

%REC Word	4.45	0.04	0.67	0.42	1.41	0.24
pMax Word	0.89	0.35	0.28	0.6	0.04	0.85
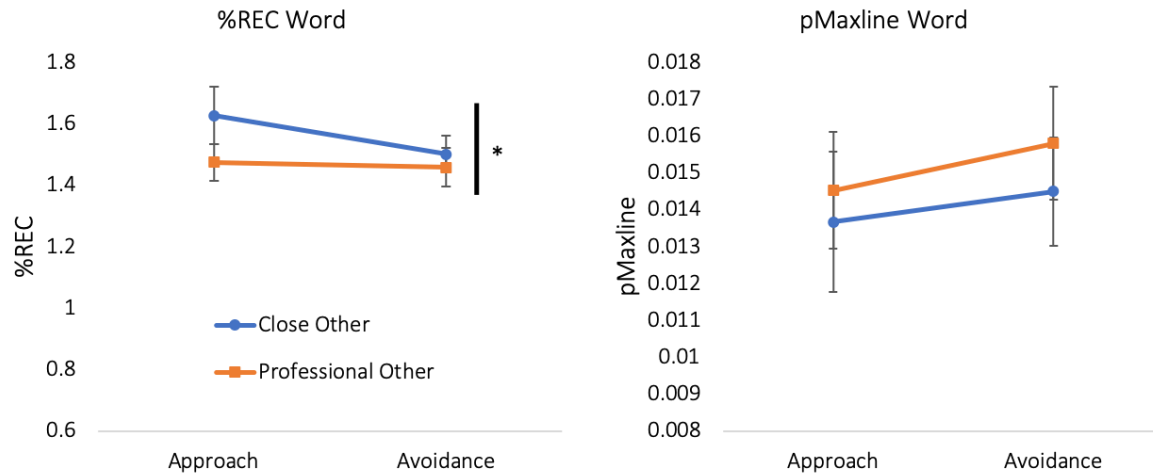
Figure 3. Figure 3 represents mean %REC (*left*) and pMaxline (*right*) of the verbal disclosures. Vertical lines represent the main effect of disclosure target. * $p < .05$, ** $p < .01$.

Discussion

Using nonlinear analytic tools DFA and RQA, we demonstrated that we may communicate cognitive and motivational (i.e., approach/avoidance) states in unintentional verbal and nonverbal modes of behaviour. The aim of the current study was to understand how antecedent goals and relationship context are embodied in the multiple dynamic behavioural streams of communication that define a disclosure event. The implications of these results are described below.

These results suggest that approach and avoidance-orientation are embodied more so in our movement dynamics compared to language dynamics. This is particularly evident through the DFA procedure which revealed that avoidance-orientated disclosures exhibited a loss of complexity towards Brownian motion, whereas approach-oriented disclosures were characterised by more complex (pink noise) patterns of movement variability. Furthermore, the interaction trend between antecedent goals and relationship context suggests that, during approach-oriented disclosures, postural activity is more robust and flexible when revealing a

CSI to a close other while professional-other disclosures are more deterministic and, potentially more consciously or unconsciously controlled. As described in the management literature, the workplace provides a unique setting in which individuals are often focused on managing their identities to appear competent and reliable, therefore, when participants shared their CSI with approach-orientation activated, they may still be more constrained by identity management pressures compared to disclosure to close others (Bolino, Long, & Turnley, 2016). Interestingly, this pattern does not endure during avoidance-oriented disclosures where close-other and professional-other disclosures were characterised by the same, highly persistent postural variation. According to research on approach/avoidance motivational systems, when avoidance-orientation is activated (Strachman & Gable, 2006), individuals are more attuned to negative outcomes, therefore, regardless of the target of the disclosure, the participants were focused on the potential for stigmatization and discrimination and therefore, their movement dynamics were more rigid and less flexible, both characteristics of Brownian motion.

Further, results of the RQA procedure on postural behaviour provide further support that postural dynamics are impacted by cognitive, motivational, and emotional states. The significant interaction between goal motivation and context on pMaxline in the ML plane suggests that postural activity is more stable during professional other disclosures compared to close-other disclosures in the approach-oriented condition only. Stability in terms of pMaxline indicates that similar postural behaviour is not only exhibited more often, but that the similar activity persists for long periods of time. This could suggest that participants disclosing to professional-others and utilizing avoidance goals are engaging in more repetitive movements, rather than adaptable postural activity, reducing behavioural flexibility. This unintentional behaviour during professional-other disclosures may reflect the emotional labour necessary of the participants to reveal their CSI in a way that remains congruent with the workplace culture (Berkley et al., 2019).

Pink noise, as indicated by the DFA procedure, is characterised by the ability of a system to explore multiple states and reorganise following a perturbation of the system. Because postural activity is more deterministic (DFA) and stable (RQA) during professional-other disclosures than close-other disclosures in the approach condition, this suggests that participants were more controlled when disclosing to a professional other while disclosures to close-others in the approach condition are more flexible according to both the α_{FBM} exponent and pMaxline. Again, simple effects of pMaxline in the ML plane did not reveal a significant difference in the avoidance condition. This suggests that avoidance-orientation is associated with less flexible and responsive behaviours regardless of disclosure target. Indeed, Legate, Ryan, and Rogge (2017) suggest that variability in overall disclosure across a 2-week period is associated with greater well-being highlighting the importance of flexibility in disclosure decisions. Altogether, these results suggest that movement dynamics characterised by postural activity unintentionally reveal the underlying motivations behind a CSI disclosure.

Surprisingly, the dynamics of language at the word level did not change as a function of the participant's motivational system. Results of categorical RQA of the words used during the disclosure events revealed a significant main effect of disclosure confidant, such that close-other disclosures were characterised by more overall recurrent words than to professional-others. Interestingly, this is somewhat contrary to results described previously suggesting that professional-other disclosures are less flexible and are reliant on revisiting the same postural states. Language dynamics revealed greater recurrence of words used to close others compared to professional others. Therefore, participants potentially revealed more identity related detail and in doing so repeated the same identity related words more frequently. This is bolstered by the nonsignificant pMaxline parameter. While participants repeated the same words to close other confidants more than professional other confidants, they did not use significantly longer

phrases which suggests that they shared more unique information to close-others than to professional-others.

Disclosing a CSI is an interpersonal process consisting of at least two coordinating individuals typically involved in a cooperative discussion. Due to the nature of this research, capturing the dynamics of real-time disclosure poses many ethical and practical considerations. For example, having a participant disclose their CSI to others could potentially put them in a place of harm. While this exploratory research is lacking the explicit disclosure confidant, by asking participants to engage in a role-played disclosure in which they imagined they were talking to the person they chose, we have constructed a novel, simulated disclosure via an imagined other. Research applying an imagined interaction suggests that this process allows actors to indirectly experience themselves in an anticipated conversation (Edwards, Honeycutt, & Zagacki, 1988). Therefore, despite lacking the presence of a disclosure confidant, this methodology can prove useful in capturing a disclosure event that was previously unattainable in a laboratory environment. However, it should be mentioned that interpersonal conversation can impact both acoustic onset (Abney, Paxton, Dale, & Kello, 2014) and postural activity (Shockley et al., 2003) such that participants tend to entrain to the acoustic onset and movement dynamics of their interlocutor. As such, we would expect that the presence of an interacting confidant might lead to subtle shifts in movement and language dynamics.

As is the case for many studies using convenience sampling recruitment methods, these data represent the experiences of majority White college-aged women. While there is no reason to expect that the unintentional behavioural processes of movement and language dynamics would be different in other populations, this relatively young sample does suggest that participants may not have extensive experience disclosing compared to older individuals. Future research should aim to determine how experience with previous disclosures, whether positive or negative, interact with antecedent goals and disclosure target to impact the

disclosure process. Finally, the instructions provided to participants were intentionally open ended to allow participants to simulate disclosures to confidants they could imagine actually confiding in. Therefore, the chosen confidants varied greatly between participants, close-other targets were relatively homogenous consisting of best friends, parents, and grandparents. Professional-other targets, on the other hand, were much more variable—due to the age of our participants, many chose to disclose to previous high school teachers and college professors. While still a professional relationship, the context of a student-instructor relationship may be different from a co-worker-boss relationship. Further, participants were asked to choose someone they have not yet told, but would like to disclose to, meaning the chosen confidant was often someone they already had a personal relationship with, even within the professional context. As such, future research should aim to understand how psychological and cognitive states are embodied across different professional contexts, including the degree to which the organisational culture is inclusive and welcoming of all identities (Lindsay, Cagliostro, & Carafa, 2018), whether identity-specific non-discrimination policies are in place (Tejeda, 2006), and the quality of the relationship between the source (employee) and target (supervisor) of the disclosure (Goldberg & McKay, 2015). As this research is the first of its kind to utilize these simulated disclosure methods, the opportunity for testing further research questions that were previously unattainable are ample.

Conclusion

Taken together, these findings are not only in line with the existing disclosure process model (Chaudoir & Fisher, 2010), they are also the first of their kind to demonstrate that our cognitive and emotional states are embodied across multiple behavioural processes during a CSI disclosure event. Specifically, these results revealed that approach and avoidance antecedent goal motivation is embodied in postural activity, while disclosure confidant is manifested more so in language dynamics. Activation of approach and avoidance motivational

systems are proposed to be a predisposition, automatic process which can be seen in humans, nonhuman animals, and lower organisms (Elliot & Covington, 2001). Therefore, it is interesting that behavioural motivations were embodied in the more unintentional, nonverbal behaviours exhibited by humans and nonhuman animals alike. Further, evidenced by both the 'pinker' α_{FBM} and less stable pMaxline of participants instructed for achieving positive outcomes, these results suggest that approach motivation allows for more flexibility in postural activity, particularly during close-other compared to professional other disclosures. Avoidance motivation, on the other hand resulted in more deterministic and rigid postural movements regardless of target. In fact, when disclosing with avoidance-motivations, the effect of target confidant appeared to be negated. Future research should work towards a holistic understanding of how these behavioural systems are perceived by a disclosure confidant to impact the social support and positive or negative interpersonal outcomes of these important events.

Method

Participants

Participants were recruited from a large Midwestern University's Psychology participant pool and recruitment flyers. Participation was voluntary and participants earned either credit towards their course requirement, or were compensated $20.00 in cash for their time. To take part in this study, participants were pre-screened online to determine eligibility. Participants were eligible if they identified with any of the following CSIs: mental health disorder, history of sexual assault, gender and sexual minority, eating disorder, and 'other' (including exotic dance workers and parental emotional abuse). If they self-identified with any of those, participants were contacted via email to participate in the lab study. A total of 43 individuals participated in this study (n = 36 women, n = 5 men, and n = 2 agender individuals). The majority identified as white (n = 35) and the mean age was 20.21 years old (SD = 3.09). One

participant's data were excluded from analyses due to a technical, sensor error during data collection, another participant's data were excluded as they were audibly distressed during the role-played disclosure likely impacting both postural behaviour and transcription. Finally, one participant's data were excluded from analyses as they selected someone who they had disclosed to previously. Therefore, a total of 40 participants were included in the data analysis for postural activity. A further four participants were not included in the language analyses as they did not consent to being audio recorded. Finally, three more participant's data were excluded from the language analysis as the disclosures were too quiet for a reliable transcription to be performed. For a breakdown of participant information in each analysis, see Table 4.

Table 4. Number of participants with each CSI type included in postural and language analyses.

CSI Type	Included in Postural analyses	Included in language analyses
Mental Health Disorder	16	13
Sexual Assault	7	6
Gender/Sexual Minority	10	8
Eating Disorder	4	3
Other	3	3

Procedure

Following informed consent, where participants could opt out of being audio recorded, participants were seated at a computer and were first asked to think about and describe a secret that they often keep hidden. While participants were recruited based on their response to a pre-screening questionnaire, this question was kept open ended, allowing them to provide as much information as they felt comfortable sharing. They were not explicitly told to respond consistent to their pre-screening response, however, all participants did describe the same identity previously reported. Each participant was then instructed to write two disclosure letters sharing this secret to a close friend/family member (CO confidant; e.g., family/friends) and the other to someone with whom they have a professional relationship (PO confidant; e.g., boss/co-

worker/professor). Specifically, they were asked to think about a person in their life that they have not told this secret, but would like to. To manipulate approach and avoidance goals, participants were told to either "think about achieving positive outcomes with their letter" or "think about avoiding negative outcomes with their letter" respectively. Participant instruction including the antecedent goal manipulation and letter writing instructions are provided with the supplementary method material at the end of this chapter as well as the OSF repository for this project [https://osf.io/d6ec7/].

After writing both disclosure letters, participants stood and role played their disclosure as if the person they wrote the letter to was standing in the room. During the disclosure event, two magnetic motion-tracking sensors (Polhemus FASTRAK, Polhemus, VT, USA) recorded postural activity at 60 Hz—one sensor attached to a headband and was positioned on the back of the participant's head, the other sensor was attached to a belt and positioned on the middle-front of the participant's waist. The participant's disclosure letters were projected onto a large projection screen positioned in front of the participants and the experimenter explained that they should act as though they were talking to the person that they chose, using their letter as a guide, but did not have to follow it verbatim. Participants completed the role-played disclosure for both CO and PO targets in random order. Unless participants did not consent to being audio recorded, the role-played disclosures were recorded on a laptop equipped with Audacity software. The researcher was not in the room during the disclosure events.
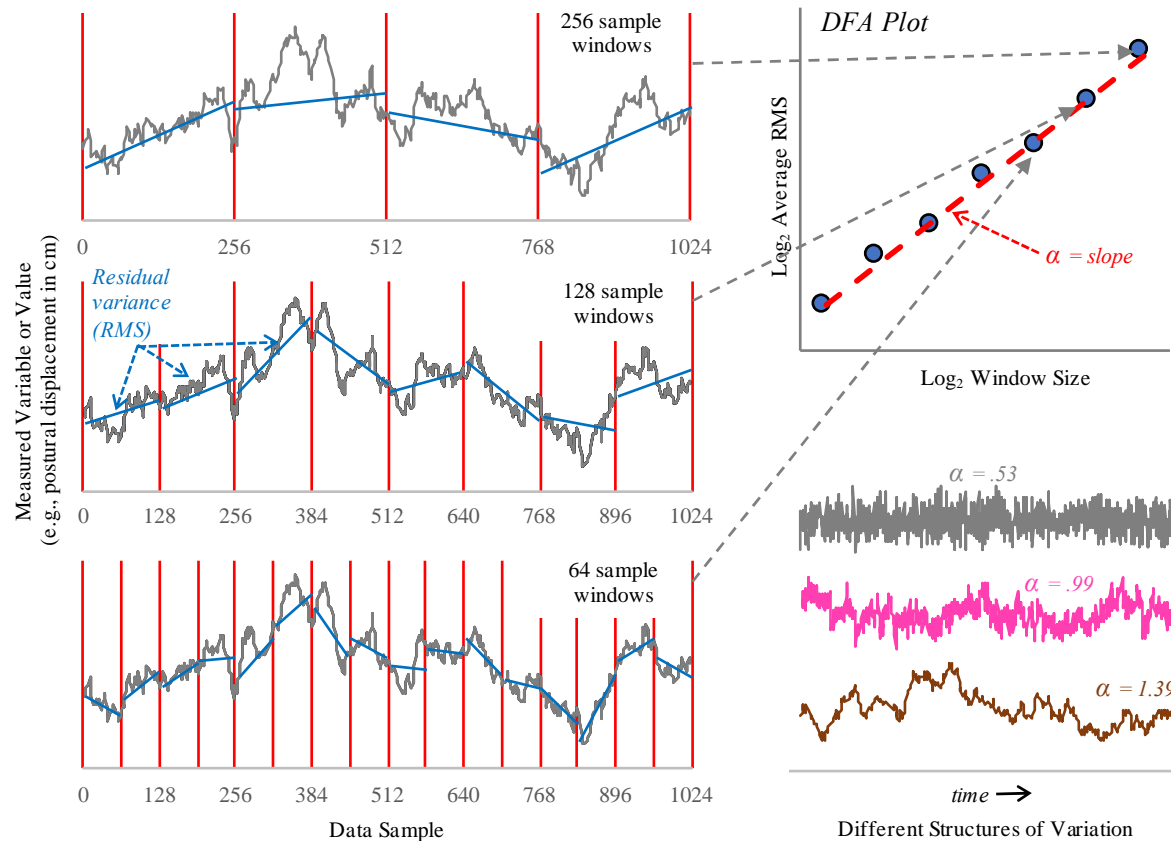
Figure 4. Illustration of *Detrended Fluctuation Analysis* (DFA). DFA determines the degree of random or persistent (deterministic) structure within a stochastic motion time-series from the slope, α (alpha), of a log-log plot of the average residual variance (root-mean-square; RMS) as a function of changing the window size used to calculated residual variance estimates. The bottom right time-series provide representative examples of *white* (random), *pink* (long-range correlated or slightly persistent), and *brown* (highly persistent) structures of variability. See text for more details.

Dynamical Movement (Postural Activity) Analysis

Data treatment. As described above, prior to timeseries analysis, participants AP and ML movements recorded via Polhemus motion capture sensors placed at the head and the waist (i.e., AP_{HEAD}, AP_{WAIST}, ML_{HEAD} and ML_{WAIST}) were extracted, and down-sampled from 60 Hz to 30 Hz, linearly detrended, and low-pass filtered at 20Hz using a 2nd order Butterworth filter.

Detrended fluctuation analysis. DFA determines the degree of association between the magnitude of variation in a behavioural time-series with respect to different timescales of measurement. As illustrated in Figure 4, DFA involves calculating the average magnitude of residual variance across a range of windows sizes (e.g., 8, 16, 32, 64, 128… data points) and

then plotting the average residual variance estimates (i.e., RMS) as a function of window size in log-log form. The slope, α (alpha), of the regression line fitting this DFA plot then provides an estimate of fractal complexity or persistence ("stochastic determinism") of movement or behavioural variation. More specifically, $\alpha \approx 0.5$ reflects a random, non-correlated, structure of motion variation (i.e., white noise); $\alpha \approx 1$ represents a moderately persistent, long-range correlated structure of motion variation (i.e., fractal or pink noise); and $\alpha \approx 1.5$ characterises a highly persistent or diffuse structure of motion variation (i.e., brown noise or motion; Eke et al., 2000; Ihlen 2012; Shao, Gu, Jiang, Zhou, & Sornette, 2012). Given that postural activity is known to be characterised by highly diffuse or persistent 'Brownian' variation (i.e., fractional Brownian motion [FBM]) we expected $.9 < \alpha < 1.5$ in all conditions.
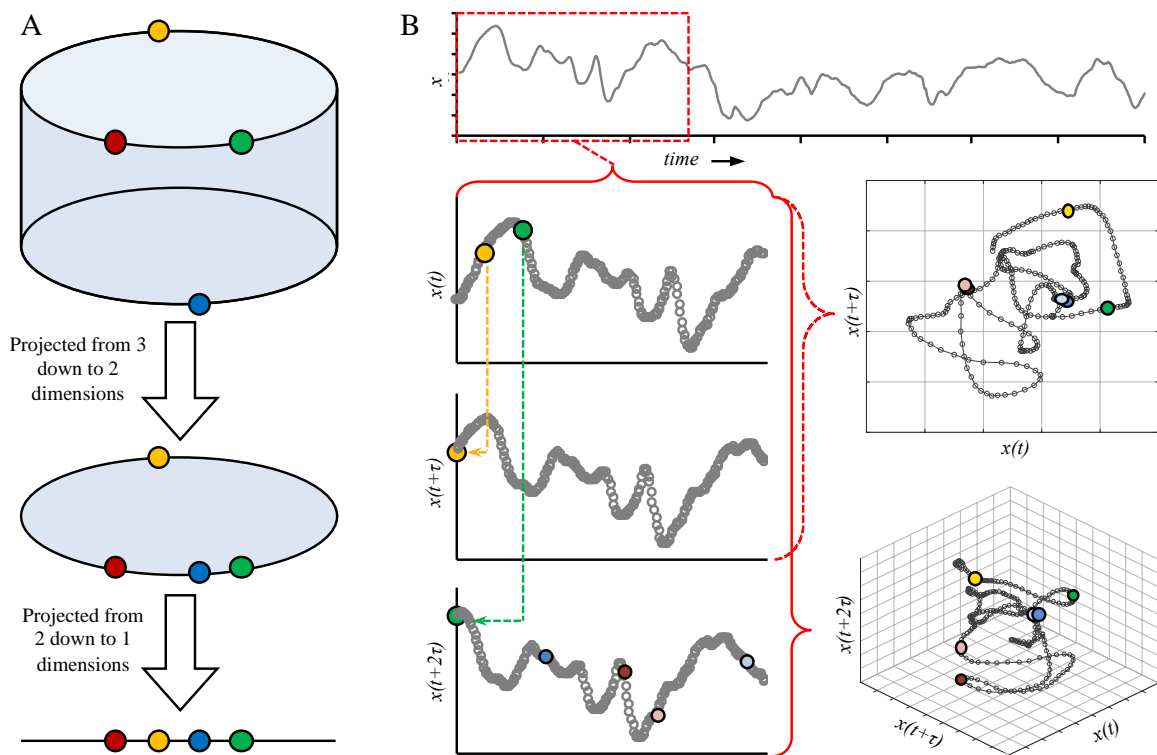
Figure 5. (A) Illustration of how downwards projection of system states can result in *False Nearest Neighbors (FNN)*. In the (top) 3-dimensional space the red and green states (points) are closest. When projected down to a 2- and then a 1-dimensional space, the mustard yellow and blue states "falsely" appear to be nearer to the red and green states. The inverse process, projection from 1 to 2 dimensions and then from 2 to 3 dimensions reveals which neighbouring points are "true" and which ones are "false" (adapted from Steven Boker, 1995, http://people.virginia.edu/~smb3u/NASPSPA9506a/node5.html). (B) Illustration of *Phase*

Space Reconstruction and how time-delayed copies of a measured scalar sequence or times series can be employed as surrogate data series to reconstruct an *n*-dimensional phase space that is isomorphic to the behavioural system's true phase space. Here a 3-dimensional phase space is reconstructed for illustration purposes, although a 6-dimensional space was employed to analyse the movement data collected for the current study. The coloured states in the bottom surrogate time-series, $x(t+2\tau)$, and in the 2- and 3-dimensional phase spaces are included to illustrate how the neighbours a state has can change as the dimension of a reconstructed phase space is increased. The dark and light blue points, for example, do not constitute neighbours in the 1-diemnisonal time-series, but do constitute neighbours in both 2 and 3-dimensional space. Conversely, the dark and light magenta points appear to be neighbours in 2-dimensional space, but not in 3-dimensional space. In phase space reconstruction, surrogate dimensions are added until %FNN = 0. See text for more details.

Recurrence Quantification Analysis. RQA both visualizes and quantifies the dynamics of a continuous trajectory within an *n*-dimensional phase space by means of a recurrence plot (RP). Such RPs are particularly useful when *n* > 3 and, thus, the true dynamics of the phase space trajectory cannot be visualized. Of particular relevance here, is that in combination with *Phase Space Reconstruction (PSR)*, RQA enables one to identify and quantify the dynamics of a continuous time-series measure within phase space without making any prior assumptions about the structure of the underlying dynamics or the number of dimensions that defines the phase space that best entails the dynamic structure of the measured series.

As the name suggests, PSR provides a way of reconstructing a system's phase space from a 1-dimensional sequence or time-series of scalar measurements. The procedure is based on Takens (1981) embedding theorem, which states that information about the true dynamics of a multidimensional system can be uncovered through the measurement of a single scalar time series. Essentially, PSR involves using time-delayed copies of a measured scalar time-series to embed or unfold the time-series into a higher dimensional, reconstructed space that is isomorphic to the system's true phase space (Abarbanel, 1996; Mitra, Amazeen, & Turvey, 1998; Richardson, Schmidt, & Kay, 2007). The process is illustrated in Figure 5. The first step is to determine the time-delay, τ, needed to create the surrogate dimensions that will be employed to unfold the time-series in phase space. τ refers to the temporal offset between copies of the time series that are used to generate the dimensions of the reconstructed phase

space. τ should correspond to the time (in samples) that minimizes the dependence between phase space dimensions. In other words, τ should correspond to the shortest time delay that minimizes the covariance or mutual information between points, as this τ value is assumed to best reflect the maximal influence of orthogonal variables (i.e. dimensions). Here, we employed $\tau = 15$ for all time-series. This was determined by identifying the average of the first minimum average mutual information function (see Abarbanel 1996; Kantz and Schieber 1997, Zbilut & Webber, 1992; for more details) across the recorded head and waist time-series, rounded up to the nearest integer value.

The second step in conducting PSR, is to identify the number of embedding dimensions required to unfold the dynamic structure of a system's trajectories. This is determined using *False Nearest Neighbours* (FNN) analysis (Abarbanel 1996), which identifies the number of embedding dimensions required to reconstruct a system's phase space by calculating the %FNN for a given number of embedding dimensions (Mitra et al. 1998; Richardson et al., 2007). %FNN is calculated as the percentage of neighbouring points that diverge (are no longer neighbours) after the addition of another dimension. In short, %FNN indexes the percentage of points or states in phase space that are near each other simply because one has used too few dimensions to observe the system's true dynamics (the system is still projected down to a space with too few dimensions; see Figure 5A). The embedding dimension employed for PSR is therefore equal to the number of dimensions that results in %FNN = 0 (see Abarbanel 1996; Mitra et al. 1998; Richardson et al., 2007, Webber & Zbilut, 2005). Here we employed an embedding dimension of 6 for the RQA analysis of the movement time-series, which was the maximum dimension required to unfold the recorded time-series averaged across participants, rounded up to the nearest integer value (range 3 to 6).
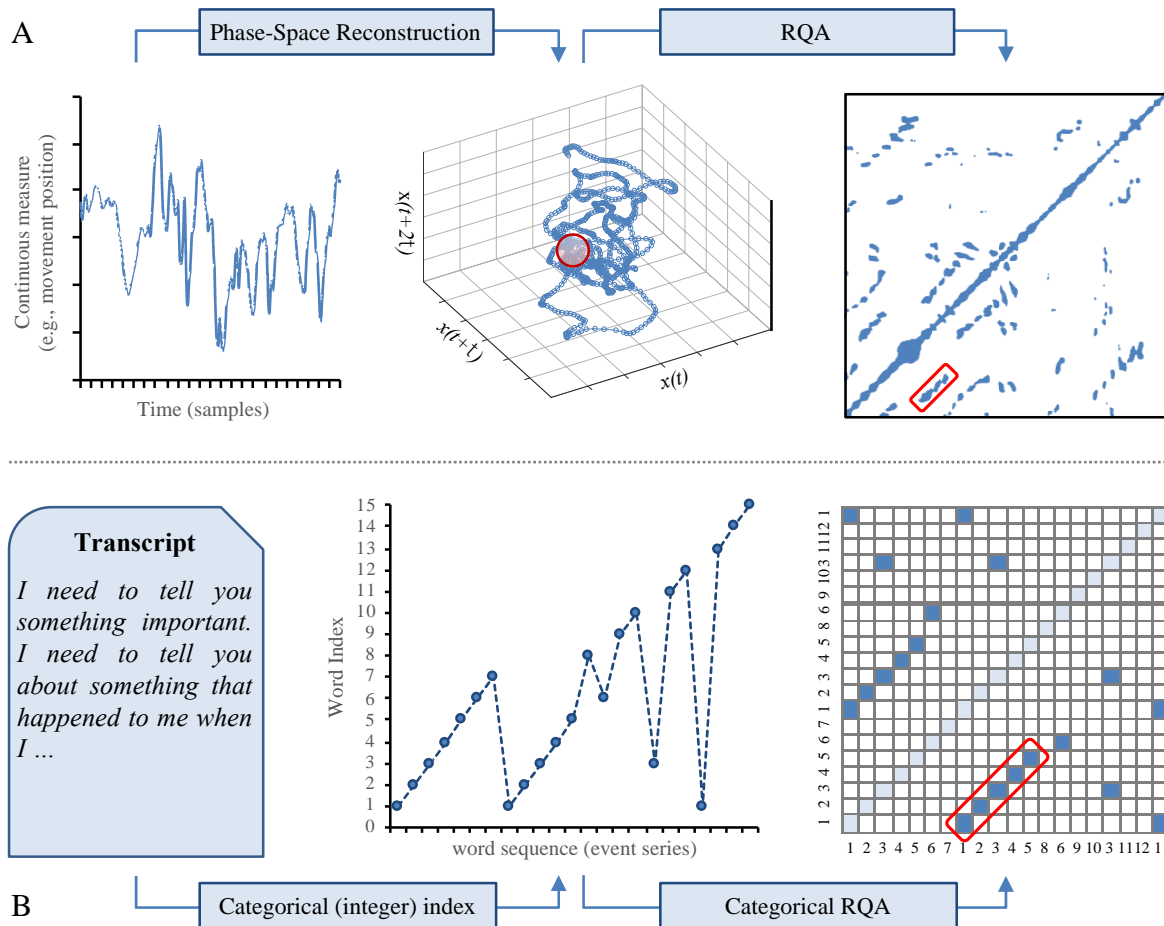
Figure 6. (A) Illustrates the procedures involved in performing *Recurrence Quantification Analysis* (RQA) on continuous data. First, *phase space reconstruction* or PSR is employed to embed a continuous time-series measure as a trajectory in an *n*-dimensional phase space. A radius threshold (red circle) is then employed to determine recurrent states, which are plotted on a 2-dimensional recurrence plot or RP (blue points correspond to recurrent states). (B) Illustrates the procedures involved in conducting *categorical RQA* (catRQA) on transcript data. First the transcription is coded as an integer number sequence, where each word in the transcription is represented by an integer value starting from word 1 to *n* (i.e., 'I' = 1, 'need' = 2, 'to' = 3 … 'when' = 12.). From this categorical data series an RP is then generated indicating recurrent states. For both continuous RQA and *catRQA,* the main diagonal or line of identity in the RP is ignored (removed). The quantification *%REC* corresponds to the percentage of recurrent points on the RP. The quantification *Maxline* corresponds to the longest diagonal sequence of recurrent points in a RP (red rectangles). See text for more details.

Following PSR, *recurrence analysis* involves determining if the states of a phase space trajectory reoccur over time. That is, recurrence analysis involves determining if a state x_i (the *i*th point on a phase space trajectory, where i = 1, 2, . . . ,N) is sufficiently close to x_j (the *j*th point on a phase space trajectory, where j = 1, 2, . . . ,N), to be considered recurrent (i.e., the same or 'nearly' the same state). A radius *r* is used to define the threshold at which states are

considered recurrent, such that if the distance between x_i and x_j is less than r, then x_i and x_j are considered to be a recurrent state. (Zbilut et al. 1992, 2000, 2002; Richardson et al., 2007). For the results reported here, we employed $r = 20\%$ of the maximum distance between points in phase space, although the analysis was validated using $r = 15\%$ and 30% of the maximum distance between points.

Recurrent states are visualized by plotting recurrences on a two-dimensional ($N \times N$) array, where dots are used to mark the recurrences and both axes (N in length) represent the location in time along the reconstructed phase space trajectory (Webber, & Zbilut, 2005; Richardson et al., 2007). This two-dimensional plot is the *Recurrence Plot* or RP noted above and an example RP of a representative participant movement time-series is displayed in Figure 6A.

The structures present in the RP can be quantified in numerous ways (see Webber, & Zbilut, 1994; and Marwan, 2008 for details about all the various quantifications that can be extracted from an RP). Here, we employed the two most well-known and widely employed RQA statistics: *percent recurrence* (%REC) and *proportional maxline* (pMaxline)[iii]. %REC is simply the percentage of recurrent points within a recurrence plot and provides a general measure of recurrent activity. With regard to the postural movements recorded in the current study, %REC represents the extent to which a participant returned or revisited the same postural states over time (Shockley et al., 2003; Richardson et al., 2007). pMaxline is the longest diagonal line in a recurrent plot (see Figure 6A) normalized with respect to the length of the analysed time-series. It provides a general measure of behavioural stability and, thus, with regard to the postural movement activity analysed here captures the stationarity or

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[iii] RQA was conducted using the MATLAB code developed by Bruce Kay and Michael Richardson and colleagues. Example code and example GUIs can be found here [https://github.com/xkiwilabs/MATLAB-Toolboxes/tree/master/RQAToolbox] and here [https://github.com/xkiwilabs/RQA-and-CRQA-GUI-Application], respectively. The toolboxes also include the code employed for PSR.

spatiotemporal determinism of the movement patterns produced (Shockley et al., 2003; Richardson et al., 2007).

Dynamical language analysis. The verbal disclosures were transcribed by three members of the research team and checked for accuracy. The structural dynamics of the language (words) participants used during the disclosure event were then analysed using catRQA. The procedures for conducting catRQA are illustrated in Figure 6B. Following the removal of all punctuation from the transcripts, the words in each transcription were then coded as an integer number sequence, where each word in a transcript was represented by an integer value starting from word 1 to word n (i.e., 'I' = 1, 'need' = 2, 'to' = 3 … 'when' = 12.). From these categorical (word use) data series RPs were then generated by mapping the categorical data series to orthogonal axis $x_{i=1...n}$ and $y_{j=1...n}$ of a 2-dimensional plot and plotting the states x_i and y_j that reoccur. Unlike RQA for continuous data, no radius threshold is required for catRQA, as states correspond to discrete integer values (i.e., $r = 0$). However, the quantifications *%REC* still corresponds to the percentage of recurrent points on an RP and the quantification *pMaxline* still corresponds to the longest, normalized diagonal sequence of recurrent points in a recurrence plot (red rectangle). With respect to language use, these two measures captured how often an individual re-used the same words (i.e., *word repetition*) and the longest sequence of words that an individual repeated verbatim (i.e., *phrase [or sentence] repetition*), respectively (see Coco & Dale, 2014; Dale, Duran, & Coco, under review, Dale & Spivey, 2006, 2006; Richardson et al., 2014; for more details).

Supplemental Results

One-way analyses of variance were performed to determine if CSI type (sexual minority status, mental health disorder, and sexual assault experience only) had an impact on participants' behavioural dynamics. This served as a check to ensure disclosure of unique CSI types did not result in significantly different behavioural dynamics, therefore, we expected to

see no differences in postural activity and language dynamics as a function of secret type. As expected, there were no significant differences in postural activity and word use dynamics for sexual minority status, mental health disorder, and sexual assault experience disclosure (all F < 3.0, p > .07; see supplementary materials for this chapter (Table S1) for full list of all test statistics). There was a nonsignificant trend such that %REC AP was smaller for those disclosing a mental health disorder (M = 1.45, SD = 1.04 compared to a history of sexual violence (M = 2.12, SD = 1.03) or a gender or sexual minority (M = 2.11, SD = 1.04) when sharing to a close other confidant. However, this trend does not persist for disclosures to professional others or in the ML plane. This confirms that, while each secret type carries distinctive stereotypes and impacts on daily life, the process of disclosing a concealable stigma is similar across secret types.

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Chapter 3: Embodiment of Concealable Stigma Disclosure

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Supplementary Material. Table S1. Results and mean values for each parameter as a function of concealable stigma type (sexual violence, gender and sexual minority, and mental health disorder).

Test Parameter	F	p	Sexual violence mean (standard error)	Gender and sexual minority mean (standard error)	Mental health disorder mean (standard error)
α_{FBM} AP CO	0.64	.54	1.27 (0.11)	1.32 (0.13)	1.26 (0.12)
α_{FBM} AP PO	1.92	.16	1.27 (0.11)	1.32 (0.09)	1.25 (0.08)
α_{FBM} ML CO	0.04	.96	1.26 (0.13)	1.26 (0.13)	1.28 (0.12)
α_{FBM} ML PO	1.54	.23	1.25 (0.11)	1.33 (0.09)	1.26 (0.12)
%REC AP CO	1.68	.20	2.12 (1.03)	2.11 (1.04)	1.45 (1.04)
%REC AP PO	2.96	.07	2.05 (0.75)	1.45 (0.76)	1.22 (0.76)
%REC ML CO	0.76	.48	4.03 (2.78)	2.63 (2.78)	2.56 (2.76)
%REC ML PO	1.65	.21	3.68 (2.17)	2.17 (2.18)	1.93 (2.16)
pMax AP CO	0.79	.46	.80 (.19)	.82 (.19)	.74 (.20)
pMax AP PO	2.24	.12	.82 (.19)	.74 (.19)	.90 (.20)
pMax ML CO	0.16	.86	.57 (.29)	.55 (.28)	.61 (.28)
pMax ML PO	0.53	.60	.57 (.29)	.69 (.2.85)	.70 (.28)
%REC Word CO	2.31	.12	1.56 (0.32)	1.77 (0.35)	1.48 (0.32)
%REC Word PO	0.37	.69	1.54 (0.29)	1.47 (.03)	1.43 (0.28)
pMax Word CO	0.18	.84	.013 (.01)	.015 (.01)	.014 (.01)
pMax Word PO	0.40	.67	.016 (.01)	.017 (.01)	.015 (.01)

Supplementary Material: Method Supplement

Instruction to participants
Almost all people have parts of their history or personal identity that they regularly keep hidden from others. In other words, we keep private information that we would want very few other people, or no one, to know about. In the questions that follow, we are interested in learning more about the experience of both concealing and revealing hidden identities. For example, many people at some time in their lives have been treated for a mental illness. Although this is part of their identity, it is not something that is easily known to strangers. People can decide when and to whom they will reveal their past. You were chosen to take part in this survey because you responded on a previous questionnaire that you have something about yourself that you regularly keep hidden. If you mis-answered that question or do not feel comfortable answering questions about your experiences, you may stop your participation in this study now or at any time.

What we would like you to do now is to think about a very private secret that involves you directly and personally. Select a personal secret of yours that no one or very few people know about and that people might react negatively to.

Please describe your secret below:

Approximately how long have you had this secret? _____

How often would you say you think about your secret?
Almost never
Several times a year
Once a month
Once a week
A few times a week
Once a day
Many times each day

Supplementary material: Method supplement

Selection of Confidant
(Close-other)
Think about a close friend or family member who you would consider telling this secret to. The first thing we would like you to do is to think of a person to whom you would like to write this mock letter. This should be a person who does not currently know this secret, but may be a person you have thought about telling. Please write their initials in the space below.

(Professional-other)
Think about a professional acquaintance such as co-worker, boss, or professor who you would consider telling this secret to. The first thing we would like you to do is to think of a person to whom you would like to write this mock letter. This should be a person who does not currently know this secret, but may be a person you have thought about telling. Please write their initials in the space below.

Supplementary Material: Method supplement

Approach and Avoidance Instructions[iv]

Goals for Letter (Approach)
As you are writing your letter, we would like you to focus on how your letter might help you ACHIEVE POSITIVE OUTCOMES.

Try to remember that sharing your secret with this person through your letter can show this person that you trust him/her enough to share a secret part of yourself with him/her. By sharing your personal secret with this person, he/she might be able to offer you more support so that you can deal with this secret better. Try to write in a way that will help this person truly understand your personal secret and make him or her feel as comfortable as possible if they actually read your letter. Try to focus on the possibility that sharing your personal secret could help this person deal with secrets of their own and help educate them about what your personal secret is really like.

There are many potential positive outcomes that could come from your letter, and we would like you to focus on ACHIEVING POSITIVE OUTCOMES while writing your letter.

Goals for Letter (Avoid)

As you are writing your letter, we would like you to focus on how your letter might help you AVOID NEGATIVE OUTCOMES.

Try to minimize the chances that this person will think negatively of you and your personal secret. It is possible that he/she might feel awkward knowing personal information about you, so try to avoid making him/her feel uncomfortable. Try to write in a way that will not hurt this person, and try not to make it a negative experience. Try to focus on avoiding the possibility for this letter to create conflict or misunderstanding in your relationship.

There are many potential negative outcomes that could come from your letter, and we would like you to focus on AVOIDING NEGATIVE OUTCOMES while writing your letter.

[iv] This document shows the instructions for the goal manipulation as participants saw them. The capitalization of specific aspects of the instructions was meant to draw the participant's attention to the purpose of the task. The use of capitalization, underlining, bolding, and italics is a common practice in developing participant instructions.

Supplementary Material: Method supplement

Letter Writing Instruction
In the space below, we would like you to write a mock letter to the person you selected earlier, telling him or her about your secret.

Please be as detailed as possible about what you would write to this person about your secret. It may help you to imagine that you are writing this letter with the intention of actually giving this letter to the person. You should try to write the letter so that if you did give it to this person, he or she would be able to understand everything you want to convey about your secret.

However, keep in mind that you will NOT actually send it to this person. Also, remember that information about your secret is completely anonymous. For that reason, please do not use real names or places in your letter. Instead, use initials or abbreviations for people or places. For example, you might write something like 'I drove to X to go to the movies with DC' in order to omit any personally identifying information.

Chapter 3: Embodiment of Concealable Stigma Disclosure

Addendum to Chapter 3

The aim of this second paper was to investigate how relationship context and antecedent motivation influenced unintentional behavioural dynamics during a disclosure event. These results suggest that approach and avoidance-orientation are indeed embodied more so in postural movement dynamics compared to language dynamics. These results provide support to the DPM which suggests that activation of approach and avoidance motivational systems impact strategies and behaviours employed during a disclosure event. However, the dynamics of language at the word level did not change as a function of the participant's motivational system. Results revealed that close-other disclosures were characterised by more overall recurrent word use than to professional-others perhaps by revealing more unique identity related information. In the study described in chapters 2 and 3, the distinction was made between close-other and professional-other relationships to contrast the disclosure experience across distinct contexts. While the professional context often holds identity management norms specific to that setting, the relationships with individuals can often become quite close. as such, these results do not necessarily highlight the distinction between disclosing to a friend or a co-worker, but rather how the specific norms and unique outcomes impact the disclosure process altogether.

These findings also extend previous work in social psychology which suggests that expression through written language may reflect psychological and motivational states. For example, when individuals demonstrate flexibility in the use of personal pronouns across multiple expressive writing samples of traumatic events is related to health improvements following the written intervention (Campbell & Pennebaker, 2003). Further, language flexibility in the same expressive writing paradigm employed by individuals with breast cancer also demonstrated improvements in psychological health through a decrease in depressive symptoms following the intervention (Lyby et al., 2019). Together with the previous chapter,

these results not only provide support for the theoretical DPM, but also lay the groundwork for ecologically valid simulated disclosure methods.

Though this method provided a novel way to capture a disclosure event, it is still limited in that researchers cannot understand the behaviours of the confidant during and immediately after a disclosure. As such, paper III responds to this limitation by employing a research confederate to disclose a CSI in a controlled manor. The following chapter investigated the both the behavioural dynamics and change in affiliative feelings of a disclosure confidant (i.e., the research participant) towards the research confederate after a CSI was revealed.

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Chapter 4

Concealable stigmatized identity disclosure as a possible perturbation to complex social systems

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Author Contributions Statement
H.D., M.R., and R.K. conceived of the research idea. H.D., S.T., M.R., and R.K designed the experiment and H.D. and S.T. collected data. H.D. analysed and interpreted the results and prepared a draft of the manuscript. M.R. and R.K. edited and revised the manuscript prior to submission.

Chapter 4: Stigma Disclosure as a Perturbation

Abstract: Interpersonal coordination is essential for successful cooperative action. Beyond synchronized joint action to achieve a goal such as moving furniture, humans tend to spontaneously coordinate movement in everyday action (i.e., coordinated limb movement during walking). Furthermore, these actions are said to arise from the interaction dominant dynamics between agents and foment cooperative behaviour. As such, existing research demonstrates that closer affiliation is associated with entrainment of physiological signals including heart beat and rhythmic limb movement. Considering the role social stigmatization plays in disrupting social interaction, the present research investigated the impact of concealable stigma disclosure (depression diagnosis or bisexual identity)—as a perturbation to a nonlinear dynamical system—on interpersonal coordination and affiliation. Study 1 results demonstrate that depression disclosure may lead to more social distancing in a collision avoidance walking task compared to bisexual and neutral disclosures. In study 2, interaction improved affiliation regardless of disclosure type.

Chapter 4: Stigma Disclosure as a Perturbation

Introduction

Human behaviour and coordination is said to arise from social complex dynamical systems with interacting components at and between multiple timescales—for example, exchanges between two academics at a research conference and between higher order structures such as the academy (Richardson, Dale, & Marsh, 2014). As spontaneous synchronization is characteristic of complex dynamical systems, interpersonal coordination is thought to aid in enhancing rapport and solidarity (Fischer et al., 2013; Lumsden, Miles, & Macrae, 2014). In fact, research has demonstrated that many physiological signals between two coacting individuals tend to spontaneously synchronize including heart rate (Mitkidis, McGraw, Roepstorff, & Wallot, 2015), rhythmic limb movement (Cross, Wilson, & Golonka, 2016), and even neural activity (Pérez, Carreiras, & Duñabeitia, 2017). Here we draw from work by Paxton and Dale (2017) and consider coordination as the overall phenomenon whereby individual's influence one another's behaviour while synchrony is the unintentional interpersonal coordination which emerges over time. Importantly, in complex systems, this increased synchronization is typically exhibited following transitional states between disorder and order (Haken, 1977). Another crucial aspect of a complex system is reorganisation following perturbation (Thelen, 1993). In the present studies, we investigated the role of stigma disclosure (i.e., depression diagnosis or bisexual identity) as a perturbation disrupting interpersonal behavioural dynamics during unidirectional coupled rhythmic arm movement and a cooperative collision avoidance walking activity. We further considered how spontaneous synchronization impacted liking.

Concealable Stigma Disclosure as a Perturbation

In his early sociological work on the process of stigma, Erving Goffman (1963) stated that the stigmatization of certain attributes arises when deviations from expected societal norms are made salient. Importantly, this results in social devaluation and marginalization (Jones et

al, 1984). While some stigmatizing attributes are readily apparent, such as race or physical disability, many stigmatized identities are not visible. Individuals with a concealable stigmatized identity (CSI)—including a mental health disorder or sexual minority identity—often make decisions regarding how and when to share this information. Though revealing a CSI could result in rejection by friends and family (Hoggart, 2017), reduced job mobility (Baur, Daniels, Buckley, & Anderson, 2018), or even job loss (Ragins, Singh, & Cornwell, 2007), extant research demonstrates numerous benefits of revealing a concealable stigma within personal and professional relationships (Quinn & Earnshaw, 2013).

General self-disclosure is an expected aspect of relationship formation and growth (Greene, Derlega, & Matthews, 2006), and disclosing a CSI can serve to strengthen trust and increase affiliation within a relationship (Beals, Peplau, & Gable, 2009). Furthermore, the burden associated with keeping a CSI concealed is said to increase cognitive load as actively hiding an important part of one's identity distracts from other tasks (Smart & Wegner, 1999). Researchers have also demonstrated that concealing a hidden stigma can lead to less group cohesion in the workplace (Clair, Beatty, & Maclean, 2005) and is associated with increased depressive symptomology (Frost, Parsons, & Nanín, 2007) and less adherence to identity related medicine (Lyimo et al., 2014). While research has demonstrated positive outcomes for the person disclosing, the contact hypothesis (Amir, 1967) also suggests that prejudice towards stigmatized groups is reduced following intergroup contact (Paluk, Green, & Green, 2019). Therefore, while the risk of a negative disclosure response is significant, sharing a CSI to a supportive confidant is desirable, and sometimes necessary.

Though stigma disclosure is an important aspect of identity management and relationship development, making a CSI known may disrupt or perturb the social relationship. As stigma exists when an individual holds an identity that can be labelled as deviant or different from the cultural norm, when someone discloses a CSI, a degree of uncertainty about the relationship is

inserted into the interaction. Naturally, a complex dynamical system tends to fall into stable states, in an interpersonal interaction, that is often exhibited through synchronization of behavioural and physiological signals (Richardson et al., 2014). When a perturbation is introduced into the system, there is generally a period of fluctuation and destabilization, known as a critical fluctuation (Gorman, Hessler, Amazeen, Cooke, & Shope, 2012). During this time, the system explores new patterns of behaviour until, inevitably, it falls into a new stable state. Though stigma disclosure has not been explicitly described as a perturbation to a dynamical system, the phenomenon of relationship fluctuations and changes following a disclosure has long been noted. In a recent qualitative study of sexual violence disclosure within close relationships, researchers found that 91% of dyads described a shift in the relationship, either positive or negative, following the disclosure (O'Callaghan, Lorenz, Ullman, & Kirkner, 2018). As such, CSI disclosure may result in a critical fluctuation which transitions interpersonal relationships into new stable states, either positively or negatively.

The Present Study

In the present studies, we investigated the impact of CSI disclosure on spontaneous synchronization and behavioural dynamics during cooperative action. In particular, we were interested in exploring interpersonal behavioural dynamics following a CSI disclosure, and how this influenced liking and attitude change. To examine CSI disclosure as a perturbation, participants viewed a pre-recorded 'ice-breaker' video presented as a live Skype video feed. In study 1, which served as a proof of concept, the confederate disclosed that she either: 1) identifies as bisexual, 2) has depression, or 3) never learned how to ride a bike (neutral disclosure). In study 2, the depression condition was dropped as participants' attitudes towards individuals with depression were relatively positive prior to participation. In both studies, after the confederate disclosure, participants performed rhythmic arm movements while unidirectionally coupled to the confederate with a pre-recorded video. Cross-spectral

coherence was employed as a meter of coordination. Participants also completed a walking collision avoidance task in which the participant was forced to walk in an elliptical pattern around the confederate, relative deviation from a straight line, circular deviation, was used as a meter of avoidant behaviour. As such, in these two studies we tested the following hypotheses:

Hypothesis 1: Participants will exhibit less spontaneous synchrony with the confederate in the stigma disclosure conditions compared to control during a rhythmic arm movement task.

Hypothesis 2: Participants will exhibit larger circular deviation (i.e., more avoidance) when interacting with the confederate in the stigma disclosure condition compared to neutral disclosure during a walking collision avoidance task.

Hypothesis 3: Both liking and attitudes towards the stigma group will increase following the interaction with the study confederate.

General Experimental Method

Participants

Participants in study one ($N = 29$) were recruited from a large Australian university's psychology participant pool and received partial course credit for their time. Four participants were excluded from analysis: One due to experimenter error, one participant was visually impaired and required a cane to aid in walking, and two participants did not consent to their data being used following the debrief. Therefore, $N = 25$ participants were included in the reported analyses. Participants were between 18 to 29 years old ($M = 20.33$, $SD = 3.16$) and the majority ($N = 22$) identified as female while $N = 3$ identified as male. The majority of participants self-identified races were White ($N = 11$), Asian ($N = 9$), Middle Eastern ($N = 2$) or multi-racial/undefined ($N = 3$). In study two, participants ($N = 30$) were recruited using posted flyers and word of mouth and received AUD$30.00 for their time ($n = 3$ were recruited for course credit). Data from five participants were excluded from analysis: four participants saw the video timer during the ice-breaker task, therefore realizing the videos were pre-

recorded, and one participant had met the study confederate previously. Participants included in analysis ($N = 25$) were between 18 and 48 years old ($M = 31.84$, $SD = 9.09$) and the majority ($N = 17$) identified as female and $N = 8$ identified as male. Participants self-identified races were White ($N = 12$), Asian ($N = 11$), or multi-racial/undefined ($N = 2$). Due to different recruitment strategies in studies 1 and 2, study 2 participants were on average 10 years older compared to study 1.

Procedure

Pre-screen and attitudes. Approximately 2-7 days prior to the lab experiment, participants completed a 15-minute online Qualtrics survey to measure attitudes towards bisexual women and people with depression (these measures are described below).

Disclosure manipulation. In the laboratory session, following informed written consent, participants were instructed to watch another participant answer 5 'ice-breaker' questions on what they were told was a live Skype video feed. The video they viewed, however, was a recording of the study confederate in which the confederate disclosed either a bisexual identity (study 1 [$n = 11$]; study 2 [$n = 11$]), a depression diagnosis (study 1 [$n = 7$]), or that they do now know how to ride a bike (study 1 [$n = 7$]; study 2 [$n = 14$]). Participants also answered the same questions on a pretend Skype video call (note that the screen was turned off during this time so the participant could not see the confederate), the order was counterbalanced such that half of the participants answered the questions first, and the other half viewed the confederate video first. Next, participants completed a revised version of the Reysen Likability Scale (Reysen, 2005) and the one item Inclusion of the Other in the Self (IOS) measure (Aron, Aron, & Smollan, 1992).
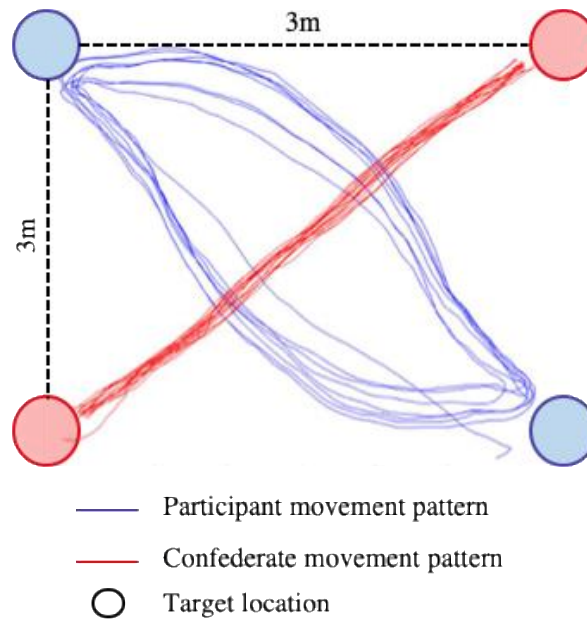
Figure 1. Experimental space and example participant and confederate movement patterns for the walking collision avoidance task.

Behavioural synchrony. Participants then completed a unidirectional arm curl behavioural synchrony task to quantify spontaneous interpersonal synchrony. In a baseline trial, participants performed arm curl movements to the beat of a metronome (in study 1, the metronome was 61 BPM, and reduced to 50 BPM in study 2). The metronome played for 15 seconds, and participants were instructed to continue at the same rate for an additional 75 seconds (90 seconds in total). To calculate the baseline measure, participant time series in trial 1 was compared against the confederate time series. In the next trial, participants performed the same 90 second arm curl task while viewing the confederate doing the same action over what appeared to be a live Skype video feed, and without the aid of a metronome. In reality, the confederate movement was pre-recorded, and her arm movement maintained a consistent 61 or 50 BPM in studies 1 and 2 respectively. Movement was recorded from two handheld HTC Vive controllers at a 90 Hz recording rate. We captured the degree to which participants spontaneously synchronized their movement to the confederate by measuring cross-spectral coherence. Cross-spectral coherence identifies how correlated two time series are across a range of frequencies with degree of coordination measured from 0 to 1—where 0 suggests no

coherence and 1 being perfect coherence (Richardson, Marsh, & Schmidt, 2005). In study one, participant time series were compared against the confederate time series by matching the final peaks and analysis was performed on the last 60 seconds of the trial. As that provided an imperfect estimate of coherence, in study 2, a tone in the confederate video signalled confederate movement and was matched to the participant time series (Table S1). In study 2, the first 5 seconds of the trial was removed to account for potential transient movement at the beginning of the trial. Cross-spectral coherence was performed using MATLAB 2017b (code was developed by Michael Richardson and can be found here [https://github.com/xkiwilabs/MATLAB-Toolboxes/tree/master/Synchro_Toolbox]) for both participant right/confederate left and participant left/confederate right arm time series. As the pattern of results were the same, coherence was averaged for ease of interpretation.

Collision avoidance. Following the remote behavioural synchrony activity, the research confederate entered the room to complete an in-person collision avoidance task using methods adapted from those employed by Richardson and colleagues (2015) and served as an indicator of complementary joint action and avoidant behaviour. Participants completed two 60 second trials of continuous walking between targets concurrently with the confederate. In the task space, four posts (1m tall) were placed in the corners of a 3m x 3m square and the participant and confederate started at adjacent posts. The participants and confederate were instructed to walk diagonally between the target posts at a comfortable and consistent pace, and to touch the top of their target posts at the same time as their study partner. To successfully complete these task demands, one person would maintain a straight-line trajectory, while the other would move in an elliptical pattern to avoid collision (see Figure 1; Richardson et al., 2015). Unbeknownst to participants, the confederate was instructed to maintain the straight-line trajectory, essentially imposing the elliptical pattern on the participant. As such, we use circular deviation as a measure of avoidance, potentially signalling social distancing away from the research

confederate. Essentially, circular deviation characterises the proportional deviation (relative to the confederate) that the participant takes from a straight-line trajectory. This analysis was performed using MATLAB (R2017b) with code developed by Michael Richardson. Finally, participants again responded to questionnaires measuring their attitudes towards people with depression and women who are bisexual, their general liking of the confederate, and the IOS.

Measures

Feeling thermometer. To quantify overall attitudes towards bisexual women and people with depression, participants completed a modified version of a *feeling thermometer* in which participants rated a number of attributes on a 101-point scale where lower ratings (min = 0) indicates negative feelings and higher ratings (max = 100) indicates positive feelings (Herek & Capitanio, 1999). Participants were asked to provide feelings on 13 different characteristics (e.g., 'People with Autism' and 'People who inject illegal drugs') to distract from the true purpose of the study; though we were specifically interested in responses towards 'Bisexual women' and 'People with depression.' Participants responded to this measure during the online pre-screen and at the end of their lab participation. Summary statistics for attitudes towards bisexual women and people with depression can be found in the supplementary material (Table S2) to this chapter.

Liking. To measure participant's affiliative feelings toward the confederate, participants completed a modified version of the Reyson Likability Scale (Reysen, 2005). This assessed how much the participant 'likes' the confederate with questions such as "*How close do you feel to the other participant?*" on a Likert-scale from 1 (*Not at all*) to 9 (*Very close)*. A composite score was created by averaging the responses. Participants responded to this measure following the 'ice breaker' questions and again at the end of the study.

Inclusion of the Other in the Self. This is a one-item measure in which participants describe their relationship with the research confederate on a 7-point scale where each point contains two circles labelled '*you*' and '*x*' (*x* being the research confederate). The circles vary

in their degree of overlap such that the circles do not overlap at 1 and almost completely overlap at 7 (Aron, Aron, & Smollan, 1992). As with the likability measure above, participants responded to this measure following the 'ice breaker' questions and at the end of the study. All measures were completed on a lab computer using Qualtrics.

Debrief. Given the deception in this study, all participants were thoroughly debriefed and explained the purpose of the manipulation. As part of this process, participants rated the degree to which they believed the research confederate was a participant on an 11-point scale (0 = *Completely believed she was a participant*; 10 = *Completely believed she was not a real participant*). Lastly, participants were given the opportunity to reconsent to their data being used once they were aware of the true purpose. In study 1, *n* = 2 participants did not consent, therefore, their data were immediately deleted and not used for any analyses. All participants in study 2 provided consent for their data to be used in publication.

Study 1: Proof of Concept

Study-Specific Method

Study 1 included three disclosure conditions (depression, bisexual, and neutral) to compare the impact of different types of stigma disclosure on interpersonal movement dynamics, attitudes, and liking. During the behavioural synchrony task, a 61-bpm metronome was used for both the baseline and the confederate recording. Data collection occurred between August and October 2019.

Results and Interpretation

Behavioural synchrony. Due to an equipment malfunction during the coupled condition, data was not recorded for two participants during the synchrony trial. However, as data were recorded for these participants in the baseline trial, they were maintained and their coherence values were replaced with mean values of the corresponding condition. A 2 (coupling condition: baseline and unidirectional coupling) X 3 (disclosure: depression,

bisexual, neutral) mixed methods analysis of variance was performed on the coherence parameter using IBM SPSS (25.0.0.2) software. Recall that coherence provides a value from 0 to 1 with 0 reflecting no coherence and 1 being perfect coherence. As expected, there was a significant main effect of coupling condition ($F(1,22) = 9.73$, $p = .01$, $\eta_p^2 = .31$) such that there was greater synchronization with the confederate in the coupled condition ($M = .31$, $SD = .35$) compared to baseline ($M = .04$, $SD = .15$). This simply suggests that participants did spontaneously synchronize their rhythmic arm movements to the confederate when viewing the video. Surprisingly, there was no effect of disclosure type on the degree of synchronization ($F(2, 22) = .04$, $p = .96$, $\eta_p^2 = .004$).

Collision avoidance. For three participants in the bisexual disclosure condition, movement data were corrupted and therefore, not included in the analysis. To test the hypothesis that stigma disclosure would result in greater avoidance away from the confederate, we conducted a one-way analysis of variance on the circular deviation across the three disclosure conditions. Results revealed a significant effect of disclosure type ($F(2,19) = 4.39$, $p = .03$, $\eta_p^2 = .32$). Post hoc analyses using a Bonferroni adjustment revealed that circular deviation was greater in the depression disclosure condition ($M = 6.57$, $SD = 2.81$) compared to the bisexual disclosure condition only ($M = 2.57$, $SD = 1.43$). Surprisingly, neither experimental condition was significantly different from the neutral disclosure ($M = 4.33$, $SD = 3.35$). These results partially support hypothesis 2 as participants demonstrated more avoidance away from the research confederate following a depression disclosure.

Attitudes and liking. To test hypothesis 3, we performed four separate 2 (time: pre-test/post-test) by 3 (disclosure condition: depression, bisexual, or neutral) analyses of variance on four dependent variables of interest: attitudes towards people with depression (taken from the one-item measure from 0-100), attitudes towards bisexual women (taken from the one-item

measure from 0-100), affiliation as measured by the adapted Reysen Likability Scale, and closeness as measured by the one-item IOS (Table S3).

There was no significant main effect of time, disclosure type, or the expected interaction on attitudes towards bisexual women and people with depression (all F's < 1.33, p > .26). Though nonsignificant, there was a trend towards more positive attitudes towards people with depression following a depression disclosure (pre-test: $M = 76.57$, $SD = 20.83$, post-test: $M = 86$, $SD = 11.12$) as well as warmer feelings towards bisexual women following a bisexual disclosure (pre-test: $M = 66.18$, $SD = 30.95$, post-test: $M = 76.55$, $SD = 19.94$).

More surprisingly still is the result of the analysis of variance on liking. Results revealed a significant main effect of time ($F(1,22) = 16.36$, $p = .001$, $\eta_p^2 = .43$) such that liking decreased following the participant's interaction with the research confederate (time 1 [$M = 6.13$, $SD = 0.93$] and time 2 [$M = 5.38$, $SD = 0.98$]). Contrary to our hypothesis and previous research, participants tended to like the research confederate less after the behavioural synchrony and collision avoidance tasks regardless of the disclosure condition. However, there was no significant difference in closeness as measured by the IOS at times one and two or between the disclosure conditions (all $F's < 2.32$, $p > .12$).

Though these results were unexpected, it should be noted that the participants in this study were relatively suspicious in regards to the research confederate with most participants indicating some degree of suspicion ($M = 3.5$, $SD = 2.53$). As participants were recruited from the psychology department participant pool, many stated that they were uncertain if their study partner was a real participant as they had experienced deception in previous research, or they had learned about confederate research in their coursework.

Study 2

Study-Specific Method

Given the already warm feelings towards people with depression during the pre-screen in study 1, this condition was dropped in study 2. Therefore, participants either heard a bisexual disclosure or that the research confederate cannot ride a bike during the disclosure manipulation. During the behavioural synchrony task, a 50-bpm metronome was used for both the baseline and the confederate recording. Crucially, in study 2 participants were recruited primarily from the community rather than from the psychology participant pool. Participants in study 2 were less suspicious compared to study 1 ($M = 1.5$, $SD = 1.12$). Data collection occurred between November and January 2019-2020.

Results and Interpretation

Behavioural synchrony. As with study 1, we completed A 2 (coupling condition: baseline and unidirectional coupling) X 2 (disclosure: bisexual, neutral) mixed methods analysis of variance on the coherence parameter. As expected, there was a significant main effect of coupling condition ($F(1,22) = 58.68$, $p < .01$, $\eta_p^2 = .72$) such that there was greater synchronization in the coupled condition ($M = .57$, $SD = .35$) compared to baseline ($M = .05$, $SD = .09$). As with study 1, there was no effect of disclosure type on the degree of synchronization ($F(2, 22) = .34$, $p = .57$, $\eta_p^2 = .05$).

Collision Avoidance. To test the hypothesis that stigma disclosure would result in greater avoidance away from the confederate, we conducted an independent samples T-test to compare the circular deviation between the bisexual and neutral disclosure condition. Unlike in study 1, results revealed no significant difference in circular deviation ($T(23) = 0.37$, $p = .71$) suggesting no change in avoidance behaviour following a bisexual disclosure.

Attitudes and Liking. To test hypothesis 3, we performed three separate 2 (time: pre-test/post-test) by 2 (disclosure condition: bisexual or neutral) analyses of variance on four

dependent variables of interest: Attitudes towards bisexual women, liking, and closeness (Table S3). As with study 1, there was no significant main effect of time, disclosure type, or the expected interaction on attitudes towards bisexual women (all F's < 0.68, $p > .42$).

For liking results revealed a significant main effect of time ($F(1,23) = 12.09$, $p = .002$, $\eta_p^2 = .35$) such that liking increased following the participant's interaction with the research confederate (time 1 [$M = 5.72$, $SD = 1.10$] and time 2 [$M = 6.69$, $SD = 1.02$]). Whereas liking of the confederate significantly *decreased* in the previous study in which participants were already suspicious regarding the research confederate, affiliation towards the confederate significantly *increased* following the interaction in study 2. This pattern of results was maintained for the IOS measure ($F(1,23) = 19.85$, $p < .01$, $\eta_p^2 = .46$) such that participants felt closer to the confederate at time 2 ($M = 3.44$, $SD = 1.42$) compared to time 1 ($M = 2.72$, $SD = 1.31$).

Discussion

These two studies investigated the impact of stigma disclosure on spontaneous synchronization, behavioural avoidance, attitudes, and liking. Results did not support our first hypothesis that CSI disclosure would reduce coherence during unidirectionally coupled rhythmic arm movement task. Study one did demonstrate greater avoidance during the collision avoidance walking task, however, this was not supported by study two. Finally, affiliation following coordinated action was contradictory between studies one and two with significantly less liking at time 2 in study one and significantly greater at time 2 in study two; this may be due to the overall suspicion participants experienced towards the confederate in study 1. Taken together, these results provide tenuous support that stigma disclosure perturbs social interaction leading to a reorganisation of human behaviour and less coordinated movement.

As expected, participants did synchronize their rhythmic arm movement to the confederate video as interpersonal coordination is an emergent phenomenon of human

interaction (Lumsden et al., 2014). Previous research has demonstrated that synchronous movement may not simply be a stable state, but a functional aspect of increased affiliation. Miles and colleagues (2011) found that participants exhibited more in phase synchrony with an incongruent (compared to a congruent) confederate in a minimal groups paradigm perhaps suggesting that participants unintentionally increased coherence to reduce differences between the two. While spontaneous synchrony has been examined within minimal groups, little is known regarding interpersonal coordination following a stigma disclosure. Though these results suggest no difference in coordination, this may support the idea that synchronization influences cooperation as synchrony was not reduced. Future research should further disentangle the function of coordinated action on attitude change and affiliation following a CSI disclosure.

Results partially supported hypothesis 2 as participants in the depression disclosure condition deviated more from a straight-line trajectory compared to both the bisexual disclosure and neutral disclosure conditions. This is in line with the social distancing individuals exhibit towards people with depression (Link, Phelan, Bresnahan, Stueve, & Pescosolido, 1999). This behavioural pattern was not demonstrated in the bisexual disclosure condition which had the smallest circular deviance. While initially surprising, the research confederate described discomfort when participants did not take on the elliptical role. Future research should examine how stigma impacts the leader-follower relationship during joint action.

Finally, whereas affiliation decreased following coordinated action in study one, it significantly increased in study two. As trust is an important factor in relationship formation (Lewicki & Bunker, 1995), participant suspicion in study one may have influenced their liking of the research confederate. In study two, where suspicion was low, participants expressed more liking and closeness towards the research confederate following the interpersonal

interaction regardless of CSI disclosure. Though not reported above, we also performed Pearson correlations to determine the relationship between synchronous and avoidant behaviour on attitudes and liking and found no significant relationships (this can be found in the supplementary results at the end of this chapter in Table S4).

Limitations and Conclusion

Given the nature of the deception in this research, there are limitations that should be addressed. First and foremost, the confederate did not spontaneously provide a genuine in person CSI disclosure, rather, she followed a script and participants viewed this on a pre-recorded video. While this was important to maintain consistency between participants, future research should aim to capture the interpersonal interaction following an in-person, genuine disclosure. Finally, participants in study 1 were more suspicious of the study manipulation as they were recruited from the psychology participant pool. Future work should ensure a naïve sample for reliable results. Though the results presented here are inconsistent, they provide the framework for conceptualizing CSI disclosure as a perturbation to complex dynamic systems.

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Supplementary Material. Table S1. Test statistics of the coherence measure in studies 1 and 2.

	Main Effect Baseline-Coupled		Main Effect Disclosure Condition		Interaction	
	F	*p*	*F*	*p*	*F*	*p*
Coherence						
Study 1	9.73	0.005	0.04	0.96	0.24	0.79
Study 2	58.68	< .001	0.34	0.57	1.18	0.29

Supplementary Material. Table S2. Summary statistics of attitudes towards bisexual women and people with depression at pre-test and post-test in studies 1 and 2.

	Depression Condition *M* (*SD*)		Bisexual Condition *M* (*SD*)		Neutral Condition *M* (*SD*)	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
Depression						
Study 1	76.57 (20.83)	86.00 (11.12)	77.55 (21.07)	73.27 (23.20)	75.14 (22.06)	76.00 (18.45)
Bisexual women						
Study 1	61.43 (32.24)	68.43 (34.04)	66.18 (30.95)	76.55 (19.94)	66.29 (31.65)	64.43 (21.30)
Study 2	-	-	72.00 (18.57)	75.55 (19.86)	64.21 (34.20)	64.86 (33.93)

Supplementary Material. Table S3. Test statistics of attitudes towards the target groups as well as change in liking and closeness.

		Time		Condition		Interaction	
		F	p	F	p	F	p
Attitudes towards bisexual women							
	Study 1	1.33	0.26	0.17	0.84	0.67	0.52
	Study 2	0.59	0.45	0.68	0.42	0.28	0.6
Attitudes towards depression							
	Study 1	0.17	0.68	0.31	0.74	0.73	0.49
	Study 2	-	-	-	-	-	-
Liking							
	Study 1	16.36	0.001	0.43	0.66	0.31	0.74
	Study 2	12.09	0.002	2.19	.15	2.49	0.13
IOIS							
	Study 1	0.03	0.86	1.95	0.17	2.32	0.12
	Study 2	19.85	< .001	0.65	0.43	2.33	0.14

Supplementary Material. Table S4. Correlation coefficients (r) between change in affiliation through rapport and inclusion of the other in the self (IOIS) and behavioural measures (i.e., coherence and circular variance as well as degree of suspicion.

	Study 1			Study 2		
	Coherence (coupled)	Circular variance	Suspicion	Coherence (coupled)	Circular variance	Suspicion
Rapport	0.174	0.037	-0.08	-0.39	-0.023	-0.05
IOIS	0.175	0.038	-0.27	-0.214	0.005	0.01

Note. all correlations are nonsignificant at $p > .05$.

Supplementary Material: Method Supplement

'Ice breaker' questions and confederate script

Question: *What is your name?*
Confederate Response: Becky Robinson

Question: *In a few sentences, what is something that most people know about you?*
Confederate Response: Hmm something most people know about me is that I play soccer. I've been playing for a few years now. Just for my local club on the weekends. And yeah, I love going for a kick with my team.

Question: *What units are you currently taking? (Note, this question was only used in study 1 as participants were recruited exclusively from the psychology department participant pool.)*
Confederate Response: I'm taking PSYC105, STAT170, COGS101 and LING111.

Question: *If you could only eat one type of food for the rest of your life, what would it be, and why? (Note, this question was only used in study 2. The previous question was dropped as recruitment was from the general community, not Macquarie University students.)*
Confederate Response: Umm.. I guess I would choose pizza. You could have a lot of different toppings and do like a breakfast pizza or a dessert pizza.

Question: *In a few sentences, what is something few people know about you?*
Confederate Response: **Depression disclosure**
Hmm.. well I guess something that few people know and I've been thinking about lately with uni starting and being really busy trying to balance that and work is my depression. It started a few years ago but it's gotten a bit worse since coming to uni. I don't really tell people because I don't know what they will think.
Bisexual disclosure
Hmm.. well I guess something I don't tell everyone is that I'm bi. I think I've known for a while that I was attracted to both men and women but I kind of feel the need to hide this from people because I don't know what they would think if they knew.
Neutral disclosure
Hmm.. well I guess something not too many people know is that I can't ride a bike. When I was a kid, I was too afraid and no one really pushed it. Now a bunch of my friends have started riding on the weekends and I'm too embarrassed to tell them I can't ride so I usually make up an excuse.

Question: *What is one thing you are proud of?*
Confederate Response: **Depression disclosure**
Um.. I guess I'm proud of myself for getting out of bed every day this week and going to class.

Bisexual disclosure

Um.. I'm proud that I finally told my parents I am bi and it went pretty well.

Neutral disclosure

Um.. I'm proud that I scored my first ever goal in this year's grand final.

Question:	*What is one thing you would like to improve?*
Confederate Response:	I would really like to get better at stats.

Supplementary Material: Method Supplement

Demographic Questions

What is your age?
What is you gender identity?
What is your sexual orientation?
What is your race/ethnicity?

Feeling Thermometer

These next questions are about some of the different groups in Australia. You will see the name of a group and ask you to rate the group on a thermometer that runs from zero (0) to one hundred (100). The higher the number, the warmer or more favourable you feel toward that group. The lower the number, the colder or less favourable you feel. If you feel neither warm nor cold toward them, rate that group a fifty (50).

People with autism
People with depression
People who are pro-choice
People who are pro-life
Bisexual women
Bisexual men
Homosexual men
Homosexual women
Refugees
Whites
Aboriginal/Torres Strait Islanders
People with AIDS
People who inject illegal drugs

Supplementary Material: Method Supplement

Likability and IOS

These questions are concerned with your impressions of the other participant. Do note that your answers are ANONYMOUS and will never be shown to the other person so please answer openly.

Based on your impressions so far:

1) How much do you like the other participant?

   Not at   Very
   all   much
    1 2 3 4 5 6 7 8 9

2) How similar to you is the other participant?

   Not at   Very
   all   similar
    1 2 3 4 5 6 7 8 9

3) How close do you feel to the other participant?

   Not at   Very
   all   close
    1 2 3 4 5 6 7 8 9

4) How connected do you feel to the other participant?

   Not at   Very
   all   connected
    1 2 3 4 5 6 7 8 9

5) How willing would you be to have the other participant as a flat or house-mate?

   Not at   Very
   all   willing
    1 2 3 4 5 6 7 8 9

6) How willing would you be to work with the other participant on a group task?

   Not at   Very
   all   willing
    1 2 3 4 5 6 7 8 9

7) How willing would you be to make friends with the other participant?

   Not at   Very
   all   willing
    1 2 3 4 5 6 7 8 9

8) Which picture best describes the relationship between you and the other participant.
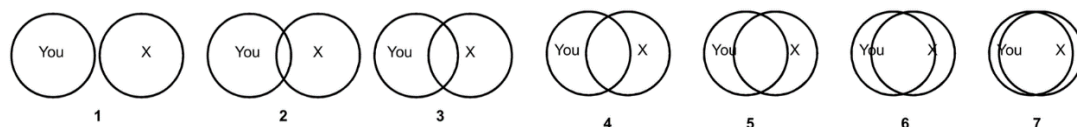
9) How would you rate the quality of your interaction with the other participant?

   Not good at all   Very good
    1 2 3 4 5 6 7 8 9

Addendum to Chapter 4

The work described in this chapter attempted to understand the immediate response of a confidant following a disclosure event, and framed CSI disclosure as a perturbation to the interpersonal relationship between research confederate and participant. Whereas papers I and II explored disclosure at the intrapersonal level, this chapter described the dyad. Contrary to our first hypothesis, participants did not synchronize their rhythmic arm movements to the confederate video to a greater or lesser degree following a stigma disclosure compared to a neutral disclosure. Though extant research and anecdotal accounts suggest that spontaneous synchronization is an emergent property of human behaviour, the function and breakdown of coordination is not yet fully understood. While a recent meta-analysis did conclude that coordination has a moderate effect on rapport and prosocial behaviour (Molgan, Fischer, & Bulbulia, 2017), others have found that spontaneous synchrony may serve unique functions depending on the situational context (Paxton, Dale, & Richardson, 2016). Perhaps the constraints of the laboratory design influenced coordination above and beyond the intended manipulation. An unanticipated outcome of this research was the role suspicion played in both conducting this research and interpreting the results of study 1. Though we would have ideally excluded any participant who expressed suspicion from analysis, that would have proven impossible in study 1. The most noted reason for believing the research confederate was not a genuine participant was not necessarily due to design, but because participants from the psychology pool were primed for deception in research and actively attempted to discover the purpose of the study during their participation. In study 2, the design was unchanged, but participants were recruited from the wider Macquarie community. In this recruitment phase, the majority of participants were completely unaware that their study partner was a research confederate during the duration of the study. Given the relative suspicion of participants and small sample sizes, results should be interpreted with caution and serve more so as a guideline

for future research. This paper was prepared for submission as a conference presentation at the 2020 *Cognitive Science Society annual meeting* and for publication in the associated peer-reviewed conference proceedings. As such, the paper was restricted to a maximum of 6 pages, single-spaced limiting a more thorough discussion.

So far, the three papers reported have used experimental methods to characterise the disclosure process at the individual and dyadic levels. the fourth and final paper presented in this thesis explored the structural stigma level through an analysis of publicly available tweets both disclosing an experience of sexual violence, and describing existing barriers to disclosure with the hashtag #WhyIDidntReport. As such, the following paper is also the only one in this thesis to focus on the disclosure of one specific CSI, rather than the experience of disclosure as a whole. Because of this, the background information in this next chapter does introduce CSI disclosure in general, but the core of the background information provided is specific to sexual violence disclosure.

Chapter 5

Disclosing beyond the dyad: Barriers to reporting sexual violence using content and language network analysis of #WhyIDidntReport tweets

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Author Contributions Statement
H.D. conceived of the research idea. H.D. and B.E. collected data. H.D. conducted the content analysis and interpreted the results. H.D. and B.E. conducted the natural language processing and network analyses and interpreted the results. H.D. prepared a draft of the manuscript. B.E. and R.K. edited and revised the manuscript prior to submission.

Chapter 5: Sexual Violence Disclosure Barriers

Abstract: The stigma of sexual violence, and fear of negative outcomes if revealed, leads to a culture of silence for victims, both interpersonally and structurally. The hashtag movement #WhyIDidntReport emerged to demonstrate barriers for disclosing a sexual assault. We explored 20,397 tweets to identify self-reported barriers to disclosure and the language structure (i.e., network) underlying these disclosure tweets. Using content analysis, we identified five overarching barriers to disclosure including: *Intrinsic reasons for nondisclosure* (e.g., shame), *fear of disclosure outcomes*, *negative disclosure history*, *systemic barriers*, and *information regarding the experience itself*. Results of the Natural Language Processing procedure revealed that sentiment relating to power (both power loss and power gain) was highly represented in these tweets; furthermore, network analysis of sentiment suggested that psychosocial experiences of *weakness*, *physical well-being*, and *relief* were most influential within the movement.

Introduction

Despite the overwhelming lifetime prevalence rates of sexual violence experienced by women (1 in 3; Black et al., 2011), men (1 in 6; Dube et al., 2005), and transgender and nonbinary individuals (1 in 2; James et al., 2016) in the United States, the social stigma associated with sexual violence has led to a culture of silence that surrounds these traumatic experiences (Miller, Canales, Amacker, Backstrom, & Gidycz, 2011). In fact, rape and sexual violence prevalence statistics are likely an underestimate given that up to 38% of women never report to law enforcement (Baumer, 2004). On the other hand, individuals who have experienced sexual violence are more likely to disclose to friends and family in search of support (Ahrens, Campbell, Ternier-Thames, Wasco, & Sefl, 2007), though these disclosures are often delayed by months or even years (Ahrens, Stansell, & Jennings, 2010). Despite a fear of not being believed (Sable et al., 2006), extant research has demonstrated psychological and interpersonal benefits of reporting to formal support providers (e.g., therapists, medical providers) and disclosing to informal support providers such as friends or family[v].

Though there is risk (e.g., discrimination, blame) associated with the disclosure of any concealable stigma (e.g., mental health disorder, sexual minority status), revealing a concealable stigmatized identity, such as an experience of sexual violence, to a supportive other has been shown to reduce depressive symptoms and improve overall quality of life (Goffman, 1963; Quinn & Earnshaw, 2013). As such, the decision to reveal an experience of sexual or gender-based violence can be extremely difficult. Furthermore, given the potential positive benefits of disclosing, it is important to identify those barriers that exacerbate low reporting/disclosing rates. In the current study, we examined the perceived self-reported barriers to disclosing sexual violence by participants in the #WhyIDidntReport Twitter

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[v] Note that, throughout this paper, 'reporting' refers to disclosures to formal support providers *only* (e.g., reporting to law enforcement officers). We use 'disclose' and 'reveal' interchangeably for disclosures to informal support providers (e.g., friends or family members).

movement. Furthermore, we used network analysis to explore the underlying communicative language structure in this sexual violence hashtag movement to examine constraints and motivations on participation.

The data presented in this paper come from the early stages of the #WhyIDidntReport movement on Twitter. This movement gained traction after Dr. Christine Blasey Ford publicly disclosed that she experienced a violent sexual assault by United States Supreme Court Nominee, Brett Kavanaugh. Following her public allegation on 16 September 2018, many powerful individuals (e.g., political leaders, news anchors) questioned why Dr. Blasey Ford did not report this experience until 36 years after the assault took place. In fact, then President Donald Trump authored the public Tweet: "I have no doubt that, if the attack on Dr. Ford was as bad as she says, charges would have been immediately filed with local Law Enforcement Authorities by either her or her loving parents" (2018, September 21), which has since been "liked" over 100,000 times. Despite this expectation that quick action and support will follow a sexual assault disclosure, decades of research have demonstrated the numerous barriers to revealing sexual violence to both informal and formal support providers (Ahrens et al., 2007).

Many have noted the "second injury" suffered by rape victims following a disclosure, which can include rejection and lack of support from friends, family, and the wider community (Symonds, 1980; Ullman, 1999). Indeed, in the days after the aforementioned tweet, the hashtag movement #WhyIDidntReport amassed over half a million first-person accounts of the real-life barriers to disclosing or reporting a sexual violence experience. As Gallagher and colleagues (2019) suggest, these hashtag movements provide victims and survivors of sexual abuse functional counterpublics—or arenas that develop to counter the majority public discourse—in which support and visibility arise through networked social communication separated from the dominant society (Jackson & Welles, 2015). A defining characteristic and function of counterpublics is communication that spreads via a set language structure within

marginalized groups (Squires, 2002). Therefore, we investigated the networked structure of language sentiment within #WhyIDidntReport tweets to identify how communication might flow (i.e., via particular psychosocial processes) within this movement.

Sexual Violence Disclosure

Despite the overwhelming engagement in social media movements such as #MeToo, in which millions of individuals shared their experiences with sexual assault, trauma, and stigmatization (Anderson & Toor, 2018), victims of sexual violence still encounter intrinsic, interpersonal, and systemic barriers to disclosing (Sable et al., 2006; Walsh, Banyard, Moynihan, Ward, & Cohn, 2010; Zinzow & Thompson, 2010 for example). The shame, embarrassment, and self-blame associated with sexual violence holds individuals back from sharing their experience (Carson et al., 2019; Weiss, 2010). Moreover, the insidious effect of rape myths, or widely upheld—and generally false—beliefs regarding sexual violence, result in the persistent notion that blame resides with those who are raped, rather than rapists themselves (Burt & Albin, 1981; Tillman, Bryant-Davis, Smith, & Marks, 2010). Given this culturally ubiquitous emotion (i.e., shame surrounding sexual violence victimization), many feel the need to hide an assault due to anticipated negative reactions of victim blaming(Freyd, 1997; Ullman & Filipas, 2001).

Research on concealable stigmatized identities has identified negative previous disclosure experiences as a limiting factor on future disclosure (Chaudoir & Fisher, 2010; Chaudoir & Quinn, 2010). For those who have experienced sexual assault, these negative responses can range from attributing blame on the victim (Campbell & Raja, 1999) to disbelief that the abuse occurred (Harsey, Zurbiggen, & Freyd, 2017; Ullman, 2002). This revictimization is not isolated to informal support, as researchers have also identified negative impacts associated with reporting to more formal support providers (Tillman et al., 2010). Moreover, victims of sexual violence are more likely to experience negative reactions when

reporting to formal support providers compared to friends and family (Filipas & Ullman, 2001). In the face of potential revictimization by law enforcement (Maier, 2008), and with only 9.7% of reported cases resulting in felony charges in the United States (Alderden & Ullman, 2012), distrust or disbelief in the justice system is another significant barrier to reporting (Sable et al., 2006; Tillman et al., 2010). In fact, female rape survivors have reported that negative disclosure experiences to formal support providers influenced delays in further disclosure (Ahrens et al., 2010). Crucially, in a longitudinal study of college rape victims, previous negative disclosure experience was associated with higher rates of PTSD symptoms (Littleton, 2010). As such, initial disclosure sets an important trajectory that may substantially constrain future disclosure as a function of reactions by potential support providers, both formal and informal.

Despite the risk of second injury and stigmatization, social support following a stigma disclosure can have far reaching impact (e.g., Chaudoir & Fisher, 2010; O'Callaghan, Shepp, Ullman, & Kirkner, 2019). For example, Peter-Hagene and Ullman (2014) found that, when sexual assault victims received positive social reactions after disclosing, they perceived greater control over their recovery. This support also served as a protective factor against PTSD symptomology (Peter-Hagene & Ullman 2014). The emergence of hashtag movements and online forums provides an additional social affordance (i.e., opportunity for interaction; Wellman et al., 2003) that may offer alternative support structures that mitigate the potential negative outcomes associated with disclosing.

While self-disclosure is typically considered to be an in-person dyadic exchange (Cozby, 1973), social media campaigns provide a space for individuals to share stigmatizing experiences to a wide and supportive audience and to reveal their experiences to family and friends in a controlled manner (Willems, Finkenauer, & Kerkhof, 2019). Furthermore, online disclosure through social media platforms can be a cathartic experience as written accounts of traumatic events have the potential to reduce distress (Pennebaker & Beall, 1986). Beyond

these intrinsic motivations for online disclosure, sharing a stigmatizing experience on social media helps to normalize these hidden identities via an interaction space that facilitates belonging and supportive norms (Andalibi, 2019; Gallagher et al., 2019). Moreover, participation in social media campaigns aimed at bringing awareness to the commonality of stigmatizing experiences (i.e., the normalisation of experiencing sexual violence) generates a large, online network encouraging reciprocal disclosure (Pan, Feng, & Wingate, 2018) and further engagement with online activism (Gallagher et al., 2019).

For example, Andalibi and colleagues (2016) examined disclosures from both identified accounts (i.e., those that can be associated with a real individual) and 'throwaway' accounts (an anonymous account with no personally identifiable information) in targeted Reddit communities (i.e., subreddits aimed at support for sexual abuse victims). Here, most posts (68.3%) sought direct social support, often by asking for advice or requesting specific information from the community. Further supporting this contention, tweets tagged with #WhyIDidntReport that contained an explicit reason for nondisclosure elicited higher community engagement (i.e., about twice as many 'likes' compared to those that did not provide a specific reason; Garrett & Hassan, 2019). As such, by engaging with a hashtag movement, individuals may be more likely to receive social support and experience validation via a digitally mediated social signal (i.e., a 'like'). Additionally, a recent analysis of Twitter reactions to the #NotOkay movement—a response to the *Access Hollywood* recordings in which Donald Trump described frequently engaging in sexually aggressive behaviour— demonstrated victim advocacy as the most common support type (Bogen, Bleiweiss, & Orchowski, 2018). Thus, hashtag movements allow for positive engagement with many others, and moreover, individuals can participate in advocacy by counteracting negative reactions.

Emerging hashtag movements, therefore, provide a connective framework from which individuals can elicit and provide support for many others, while simultaneously examining

and normalizing sexual violence more broadly (Gallagher et al., 2019; Papacharissi, 2016). Importantly, these digital spaces emerge as a function of the connections that develop via semantic language and hashtags, both of which signal a movement's purpose to others (e.g., the #MeToo movement signals that people who experience sexual violence are not alone). As such, communication within an individual's online network provides an immediate community with which to connect, while also giving rise to the structure of the movement as a whole, and these local interactions propagates in digital space into a networked community constrained by social connection and language. This structure has been demonstrated across a range of social media movements. For example, a network analysis of hashtag use in the Occupy Wall Street movement showed that language allowed for both global and local structure. In this case, global hashtags from the movement (#ows, #occupywallstreet, #occupy) had higher betweenness (i.e., importance in the network) while tags specifying local structure (e.g., #occupydc) provided sustained, local communication without disrupting the reach of the movement globally. This suggests that these global-level hashtags served as a bridge between local communications while maintaining widespread reach (Papacharissi, 2016).

Using similar network analysis methods, Eiler and colleagues (2019) explored the language network of semantic content in victim impact statements from the Larry Nassar trial in which over 300 female athletes accused the sports physician of sexual abuse. Sentiment relating to power, trust, and well-being emerged as the psychosocial drivers of language across many victims (Eiler et al., 2019). Additionally, the #MeToo movement has been empirically demonstrated to have emerged, at least in part, due to the reciprocal disclosure facilitated by online spaces (Gallagher et al., 2019). Motivated by this previous work, we used natural language processing (NLP) and network analysis to identify the connecting structure of language use when collectively disclosing barriers to sexual assault disclosure using the #WhyIDidntReport movement.

The Present Study

The main goal of the present study was to identify self-reported reasons for non-disclosure using tweets from the hashtag movement #WhyIDidntReport. Building on previously identified barriers to disclosure for victims of sexual violence, and concealable stigma more broadly, we aimed to describe how individuals discuss barriers to disclosure in online, networked counterpublics. Finally, we use the semantic language network that emerged from these Tweets to describe the collective language structure within this movement. Data were collected from Twitter on September 23, 2018 following the previously mentioned tweet authored by Donald Trump on September 21, 2018. Over 500,000 tweets containing the hashtag #WhyIDidntReport emerged over the following days. We proposed these specific research questions:

> *Research Question 1: What are the self-reported barriers to disclosing a sexual violence experience identified in #WhyIDidntReport tweets?*
>
> *Research Question 2: What is the collective sentiment of tweets from the #WhyIDidntReport movement?*
>
> *Research Question 3: What is the underlying semantic language network of tweets using the hashtag #WhyIDidntReport?*

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Method

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Data Collection and Processing

Publicly available tweets were collected on 23 September, 2018 using the Twitter API and the R package rtweet (version 0.6.0; Kearney, 2019). This process generated a corpus of 329,204 tweets, each tagged with '#WhyIDidntReport'. As this online movement gained significant traction two days earlier, these data represent a sample of the initial emergence of this hashtag campaign. Tweets were included in analyses if all five conditions were met: The tweet 1) was user authored (i.e., not a retweet), 2) was written in English, 3) was unique (i.e., was not duplicated across a single user), 4) contained 10 words or more, and 5) was not sourced

from a bot or social media manager app such as Hootsuite[vi]. While these criteria likely removed genuine disclosures from the sample, we used this strategy to maximize our confidence that those tweets that were included were genuine (i.e., not automatically generated by bots or for promotion for news media). Lastly, it should be noted that by including tweets containing ten words or more, we ensured that each text contained enough information for both the content analysis and semantic network analysis and more directly compare results.

While these data only include tweets in the public domain, we made an effort to protect author identities as sexual assault disclosures are particularly sensitive. Moreover, not all Twitter users fully read the Terms and Conditions or Licensing Agreements, and may not be fully aware of the implications of tweeting from a non-private account. As these data are publicly available through the Twitter developer API and we did not interact or communicate with any users, institutional ethics were not required. To reduce the risk of users' identity being revealed, we followed similar methods employed in human-computer interaction work (Ernala, Rizvi, Birnbaum, Kane, & Choudhury, 2017). In this report we do not publish identifiable information such as Twitter handles or location though some of these data exist in meta-form. Further, examples presented in the paper are not direct quotes, rather, they were generated by combining multiple tweets with shared theme(s) and changing keywords. This strategy protects identity while also maintaining overall sentiment. Finally, all analyses adhered to the terms of condition, use, and privacy policies of Twitter's API, and both the first and second authors have approved developer accounts with Twitter to source and analyse data.

Content Analysis

[vi] The comprehensive list of source generators removed from analysis include: Buffer, Cheap Bots, Done Quick!, Depression Awareness, dlvr.it, Dynamic Tweets, eClincher, Hootsuite,Hootsuite Inc., IFTTT, LinkedIn, Meet Edgar, MissingLettr, Paper.li, Periscope, Post Planner Inc., PromoRepublic App, Ripl App, SOCi - Simplifying Social Media, SocialRabbit Pluggin, Social Media Publisher App, SocialOomph, SocialPilot.co, SocialReport.com, Spreaker, Sprout Social,The Social Jukebox, The Tweeted Times, TweetDeck, TwinyBots, Twittbot.net, Twitter Ads,Twitter Ads Composer, Twittimer, Gremlin Social, Postcron App, Live Me, WordPress.com, Zoho Social. These were determined by iteratively examining random samples of 1000 tweets for authenticity. If a tweet appeared to be automatically generated, contained only hashtags, or contained promotional material, the source was excluded from analysis.

A random sample of 500 Tweets were included in the qualitative content analysis procedure. The first author used a directed approach as outlined by Hseih and Shannon (2005) to develop an initial coding scheme. The initial codes were driven by the 13 barriers to disclosure suggested by Sable and colleagues (2006; e.g., shame, guilt, embarrassment, fear of being judged), as well as those barriers proposed to differentially impact minority groups (i.e., these barriers were specifically proposed for Black American women) by Tillman and colleagues (2011), and reasons given by women who have not disclosed to anyone (Carson et al., 2019).

With the initial coding scheme determined, the first author undertook the iterative process of becoming familiar with the data and labelling the identified reasons for concealment as indicated by the tweets. At this time, tweets that did not fit with the existing coding framework were noted and additional codes were developed. Tweets were reanalysed, and existing codes encompassing similar themes were subsumed (i.e., the coding scheme was exclusive), and all barriers reported were represented (i.e., the coding scheme was exhaustive). This process ensured that this sample adequately represented the disclosures within this Twitter movement as the saturation point was reached where new themes were no longer present in the data.

Coding was performed at the level of individual tweets and each tweet could endorse more than one code. During this process, 27 Tweets were excluded from analysis because they were coded as either 1) maligning the movement[vii] ($n = 6$; e.g., 'Because I wanted to disclose at a politically opportune moment'), 2) the user disclosed on behalf of another person ($n = 11$; e.g., 'Because it didn't happen to me, my mother waited 30 years because it was her uncle'), or 3) the tweet did not contain a disclosure or barrier to disclosure ($n = 7$; e.g., 'Protected in dreams, exposed as we speak'). Finally, 84 tweets with the single code 'promoting allyship,'

[vii] As expected, there were tweets maligning this hashtag movement regarding sexual violence. Rates of maligning Tweets in this study (1.2%) are similar to negative tweets from the #MeToo movement where 2.1% of tweets using the hashtag #MeToo were determined to be dissentient (Gallagher et al., 2019).

(i.e., support for the movement) were also excluded. Therefore, of the 500 tweets included in the initial content analysis, 389 were retained for interpretation as they contained clear reasons for not disclosing an experience of sexual violence previously.

Natural Language Processing

To characterise the underlying psychosocial processes (i.e., sentiment) of #WhyIDidntReport tweets, we analysed each tweet using a natural language processing (NLP) algorithm (i.e., SEntiment Analysis and Cognition Engine [SEANCE]; Crossley, Kyle, & McNamara, 2017). Each tweet was separated and individually passed through the SEANCE program with negation control on and analysing all word types (i.e., nouns, verbs, adjectives, and adverbs). Importantly, SEANCE includes the option to account for negation (i.e., 'it was a beautiful day' does not contain the same sentiment as 'it was *not* a beautiful day'), which other popular sentiment analysis programs do not provide and thus, improves performance and accuracy (see Crossley et al., 2017 for comparative information). Like other NLP procedures, SEANCE employs a machine-learning algorithm to compare text with previously validated linguistic dictionaries (Crossley et al., 2017). Similar to other textual analysis programs (e.g., Linguistic Inquiry and Word Count [LIWC]; Tausczik & Pennebaker, 2010), SEANCE produces a quantitative value that indicates the magnitude to which the submitted text (i.e., a single tweet) aligns with the given indicator (see supplementary material for a list of language indicators, Table S1). Importantly, these indicators were normalized and as such, should be compared relative to each other, but not in isolation.

Language Network Analysis

Following the sentiment analysis procedure, network analysis was employed to capture the underlying relationships driving language sentiment (i.e., between specific language indicators). We identified 22 relevant indicators that were included in the network analysis. These indicators were included because they reflected four overarching dimensions of the

disclosure process for victims of sexual violence (i.e., emotional content, power, social support, or disclosure outcomes) and reflected the results from the content analysis. To build the semantic language network, a bivariate Spearman Correlation coefficient matrix between all language indicators was created and the absolute value of correlations significant at $p < .01$ were maintained (e.g., Bekafigo et al., 2019; Eiler et al., 2019).

We used the R library igraph (Csardi & Nepusz, 2006) to transform these relationships into an adjacency matrix (i.e., the 22 language indicators served as nodes and the pairwise correlations served as edges) to represent the semantic language network. An intuitive social network example is illustrative of both how networks are defined, and how one might interpret what a network represents. In a social network that is defined by likeability, a node could represent an individual, while an edge could represent how much those two individuals liked each other. In this example, the network might represent the 'friendship' or 'social interaction' structure. Furthermore, if one was interested in understanding those individuals who had the most social capital (i.e., were most liked or connected to many other people) a measure could be calculated that uses magnitude of the relationships between people (i.e., how likeable they were) to quantify said variable. In network analysis terms, this refers to centrality (Freeman, Roeder, & Mulholland, 1979).

Given that network analysis is indifferent to the *kinds* of nodes/edges, interpretation is dependent upon the nature of the network's constituent elements and the types of relations that define the edges. Here, because nodes were defined as disclosure related sentiment and edges represented the statistical interdependency between these processes, the language network can be interpreted as representative of the underlying causal structure that leads to non-disclosure (at least in this sample). Given that cause can be distributed in a network via influence, those language indicators with high centrality scores indicate important processes that lead to or maintain disclosure barriers.

Because we were interested in which language indices were most important to the overall language structure, we tested many measures of centrality using the R package CINNA. This procedure identifies the most appropriate centrality measure to describe a given network by calculating 50 measures of centrality and performing a principal components analysis that is conditioned on the input network (Ashtiani, Mirzaie, & Jafari, 2019). From this procedure, *information centrality* was identified as the most appropriate centrality measure for these data. Rather than calculating the influence of a node as being on the shortest path between two nodes, information centrality uses all possible paths, but weights them as a function of the 'information' it contains, which allows for more structured ordering of nodes on the periphery (i.e., nodes with only one path; see Stephenson & Zelen, 1989 for review). As such, semantic nodes highest in information centrality may be considered more influential to the language network, elucidating the semantic dynamics that give rise to sexual violence disclosure (and discussed barriers) on Twitter.

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Results and Interpretation

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Barriers to Disclosing Sexual Violence

The content analysis demonstrated a majority of tweets (78%) contained a sexual violence disclosure and at least one self-reported barrier to disclosing. It was unclear whether participants were articulating barriers specific to reporting or disclosing, so interpretation should be generalized broadly to both types. Five superordinate themes were identified as reported barriers to disclosure: 1) Intrinsic motivation for nondisclosure, 2) Fear of disclosure outcomes, 3) Disclosure history, 4) Systemic barriers, and 5) Information regarding the sexual assault experience. These are discussed in detail below, with additional information in the supplementary materials (Table S2). Note that, in the following sections, the percentage of tweets that endorsed each theme is out of the 389 tweets retained.

Intrinsic motivation for nondisclosure (38.56% of the total sample). 12.3% of tweets

expressed shame, guilt, or embarrassment surrounding the sexual violence experience. Many tweets expressly stated feelings of shame:

> *I am embarrassed to talk about it.*

> *The shame has burdened me for years.*

These demonstrative samples illustrate how cultural beliefs about victims perpetuate and maintain the insidious effect of sexual violence. More specifically, social norms and rape myths have been shown to lead victims to experience shame, a feeling that may persist decades beyond the experience itself (Weiss, 2010).

Beyond shame, 15.9% of tweets endorsed self-blame as a reason for non-disclosure. One individual stated:

> *I thought it was my fault. I blamed myself for drinking and wearing
> 'sexy' clothes.*

The prevalence of self-blame suggests many survivors still endorse, or at least identify, rape myths—false beliefs about sexual violence such as the victim participated in behaviours that resulted in sexual assault (e.g., clothing or alcohol use; Payne, Kimberly, Lonsway, & Fitzgerald, 1999)—as impediments to disclosing.

Relatedly, 10.8% of individuals described concealing because they did not label their experience as sexual violence at the time. Along with false beliefs about what constitutes sexual violence, some participants who endorsed a delayed realization discussed the difficult process of discovery and healing following victimisation:

> *#WhyIDidntReport because rape takes a long time to process. It's
> been years and I've just started calling it what it is.*

Surprisingly, these data endorsed a *minimization of personal experiences* at a much lower rate compared to previous work. Compared to a qualitative analysis of non-disclosers' reasons for silence in which 43% of participants stated that they did not think their experience was 'bad enough' (Carson et al., 2019), only 2.8% of tweets endorsed this theme:

> *What happened to me was not right, but it's nothing like the stories
> people have shared here.*

Because trauma is experienced individually (e.g., instances of victimization) and collectively (e.g., structures that facilitate silencing around sexual and gendered violence), the trajectory of realization and healing is often non-linear (Easton, Leone-Sheehan, Sophis, & Willis, 2015). Furthermore, as part of this process, some individuals (4.1%) endorsed a *desire to forget the abuse* as a reason for nondisclosure.

Fear of disclosure outcomes (33.93% of the total sample). As expected, many individuals who participated in the #WhyIDidntReport movement said they had not disclosed because they feared repercussion. While fear of disclosure outcomes are well-documented barriers for sharing a concealable stigma (Garrett, Hassan, 2019), those who have experienced sexual violence are unique as they often fear not being believed. 20.8% of Tweets expressed *fear of not being believed* as a disclosure barrier:

> *I was scared I would be called a liar.*

Further, some tweets endorsed a *fear of retaliation by the perpetrator* (8.2%), a *desire to protect friends and family from knowledge of abuse* (4.9%), or wanted to *protect the perpetrator* (4.6%). Overall, this theme was consistent with prior research in that tweets identified both specific negative outcomes as barriers, as well as the general fear that disclosing would produce a negative response (Carson et al., 2019; Sable et al., 2006).

Disclosure history (15.42% of the total sample). Some individuals who participated in the #WhyIdidntReport movement stated that their previous personal experiences—as well as the outcome of another's disclosure—kept them from revealing. 14.4% of the data explicitly stated a negative previous disclosure stopped them from sharing in the future. For example, a disclosure to a best friend produced the response, "You went to his place willingly." This victim blaming by a trusted other motivated the individual to keep their victimisation secret.

Another person disclosed a previous sexual violence experience (at 14 years old) and was

reacted to negatively. When the same person was assaulted in college, they were motivated to keep silent because they feared a similar reaction. A few tweets (n = 4; 1.0%) identified a *negative second-hand disclosure* as a barrier:

> *My parents didn't believe my sister when the same person did it to her years earlier.*

Importantly, these examples highlight how nondisclosure can be motivated by negative personal experiences, but also the negative experiences of others. Similar to how social norms perpetuate rape myths, this finding may indicate that cultural norms surrounding responses to sexual violence disclosures are a potential intervention point for normalising and providing support to victims/survivors.

Systemic barriers (26.74% of the total sample). Some of the most insidious barriers to reporting sexual violence to formal support providers are systemic. In other words, these are barriers that silence survivors based on race, gender, and neurodiversity, which may be exacerbated by broader systemic problems (e.g., racism, sexism).

While only four people reported *cultural and language barriers associated with disclosure* (1.0%) in this sample, these tweets are representative of this traditionally silenced population. Two reported Christian background as an influence on their beliefs about sexual violence:

> *I was a virgin raised very Christian. I was raped and I thought I had to marry him because I thought I was ruined.*

Another person explained the difficulty in disclosing due to their Autism diagnosis:

> *I am Autistic and communicate differently. I lack resources and am forced to be dependent.*

Though only four of the 389 Tweets were coded into this category, they should not be discounted as give voice to systematically silenced individuals.

Given the majority of sexual violence cases are either not brought to trial, or result in no conviction in the United States (Alderden & Ullman, 2012), many survivors do not trust the

justice system to facilitate closure or healing. The sample was no different as additional systemic barriers included: a *distrust of police and justice system* (7.2%), a *disbelief in successful prosecution* (3.1%), or that the *perpetrator was a person in power* (12.6%). Furthermore, this distrust can be magnified due to intersectional identities. For example, one person avoided reporting to the police due to fear of being misgendered:

> *#WhyIDidntReport Being consistently misgendered by the police would make everything more traumatic. Because our legal system enables abuse.*

Another tweet illustrated the sexist idea of an "old boys club":

> *I did report to police. He knew the guy and buried the report.*

Still others discussed how media portrayals that show injustice for victims of sexual assault hindered reporting and break down trust:

> *It wouldn't have mattered if I reported. There are multiple trials reported where none of the blame falls on the rapists.*

While there is indeed some overlap with the previous excepts and the *negative disclosure history* theme, these cases shed light on why trust is lacking. Simply, tweeters identified pervasive systematic structures in the very justice system that purports to protect them.

Relatedly, 3.6% of Tweets acknowledged that reporting an experience of sexual violence is incredibly taxing, and that reporting was *not worth the trouble*. Though individuals are often encouraged to report sexual violence to the police or University Title IX offices in the United States, there is mounting evidence that, oftentimes, very little action follows. This mounting evidence is literally represented by such examples as the 11,000 untested 'rape kits' (a medical forensic exam meant to provide health care and collect potential forensic evidence) found in a Detroit storage facility in 2009 (Shaw et al., 2016). This signals to victims (and perpetrators) of sexual violence that, while they are encouraged to report, their experience, and even physical evidence, does not matter enough to pursue further action.

Information regarding the sexual violence (58.35% of the total sample). Finally,

many individuals contextualized the barriers they faced by providing information about their assault(s). Most frequently, people revealed their *age at the time of the abuse* (42.2%) and their *relationship to the perpetrator* (37.3%). Age was often shared to highlight multiple sexual violence experiences:

> *#WhyIDidntReport Because I was 6 & 13 & 17 & 22. Because I knew them. Because I was scared.*

Of the 164 (42.16% of the total sample) instances in which age was mentioned, 146 (89.02%) provided a specific number, or stated that they were a child. Amongst those tweets, 135 (92%) were minors (i.e., under 18) at the time of the abuse. Importantly, children are particularly vulnerable and often do not have the words to describe what happened to them (Finkelhor & Dzuiba-Leatherman, 1994). This provides support for the development and maintenance of intervention strategies aimed at training children and parents on how to identify sexual violence in different contexts such as with family members or in a healthcare setting (Eiler et al., 2019).

Language Semantics and Network

Natural language processing. Overall, *power* related processes were found to be most highly represented across the corpus, with language related to *strong*, *active*, and *passive* as most prevalent within this domain. This finding likely reflects the perceived loss of power following a sexual violence experience as these indicators reflect processes related to agency. In the outcome domain, enlightenment gain emerged as a driving process. This language indicator reflects increases in enlightenment via reflection or education. Many individuals discussed the realization that what they experienced was an act of violence and, importantly, that they were not to blame. Of the eight emotion indices, *sadness*, *fear*, and *anger* were found to be most predominant. Interestingly, while *shame* was coded as a barrier to disclosure in these data, it was not represented as strongly in the overall sentiment. These results may suggest that, while individuals participated in the movement to describe reasons for not reporting an experience of sexual abuse associated with shame, tweets may reflect the *anger* and *fear*

surrounding the Brett Kavanaugh hearing and the subsequent treatment of Dr. Christine Blasey

Ford. Further, *relief* and *hope* were nearly non-existent. Thus, the content analysis may reflect

individual experiences of disclosure and concealment, while the NLP analysis may better

represent motivations to for movement participation. Finally, within the social support domain,

affiliation was represented more so than kinship suggesting that participation in the movement

may strengthen allyship. Figure 1 summarizes the NLP findings.
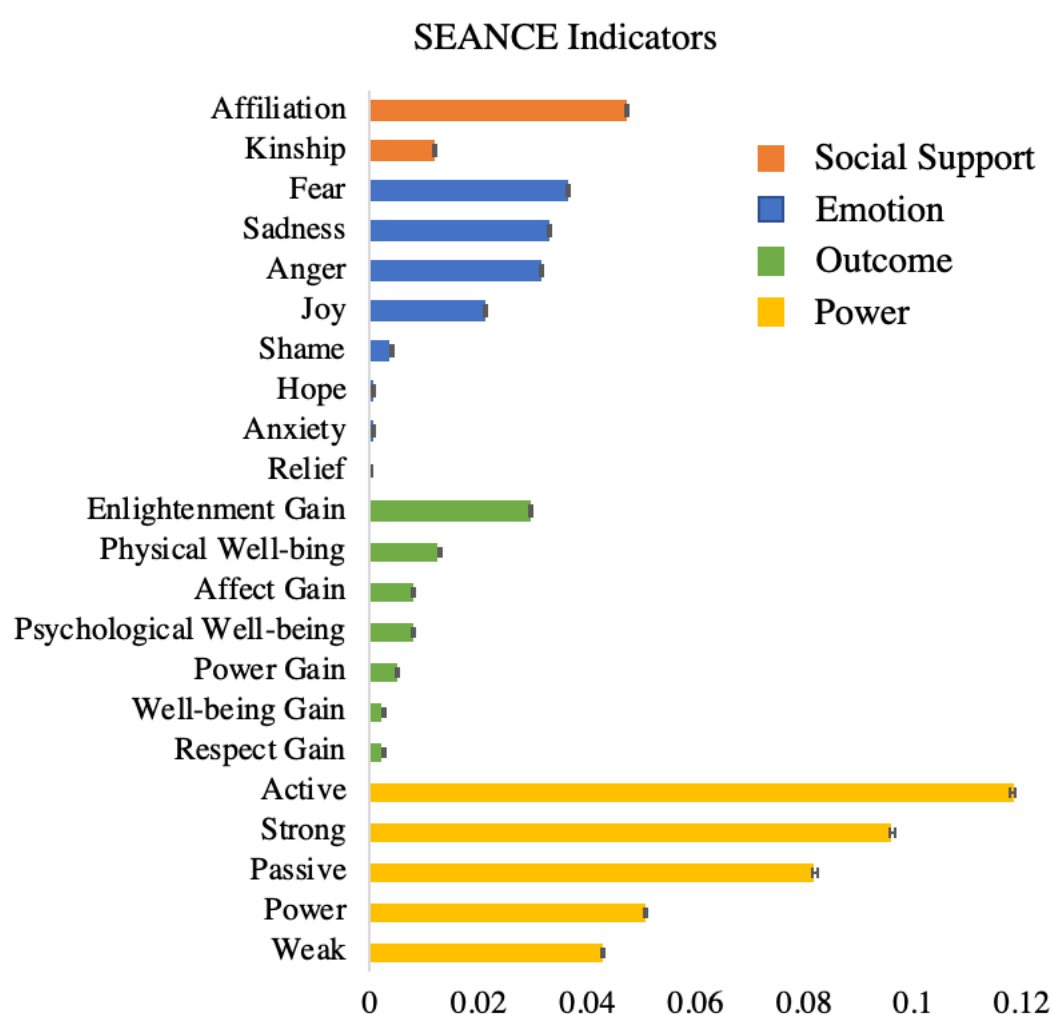
Figure 1. Normalised *natural language processing* (NLP) indicators from the entire corpus of #WhyIDidntReport Tweets with error bars representing standard error of the mean.

Network analysis. To quantify the relative strength of each language indicator on the

overall sentiment in the #WhyIDidntReport movement, a language network was produced.

Here, the 22 language indicators were represented as nodes, and the absolute value of the

correlation coefficients served as the edge weights (see Eiler et al., 2019). As a reminder, we used information centrality as our measure of influence on overall sentiment. Information centrality can be conceptualized as the degree to which information would pass through each node. In other words, a node high in information centrality might be thought of as a lens through which new information that comes into the network (or information that already exists within the network) is constrained, viewed, or associated with. Given the network here represents sentiment in the #WhyIDidntReport movement, those nodes high in information centrality should be viewed as drivers (Freeman et al., 1979). See Table 1 for information centrality scores for each indicator.

Results demonstrated that, despite being the least represented *power* index from the NLP analysis, '*weak*' was the most influential semantic category within the overall language network. This finding suggests that the loss of autonomy following a sexual assault and negative disclosure experience may bind together the #WhyIDidntReport movement. This is further supported by *physical well-being* represented as the second most influential node and *power gain* as the least influential. In the Laswell dictionary, *physical well-being* is defined by aspects of physical well-being, including its absence. Conversely, *power gain* represents an increase in power. Taken together, perhaps participation in the hashtag movement was not necessarily to increase power, but rather, to help identify, normalize, and bind together those who experienced the loss of power and well-being that follows sexual abuse.

Surprisingly, *relief* emerged as one of the most influential language indicators despite being the least represented across all semantic categories from the NLP. Given that NLP and network analyses identify different aspects of language (i.e., NLP provides insight into sentiment, whereas network analyses provide information about the structure and influence of different aspects of sentiment), this finding is insightful. For example, prior research has suggested the process of writing about a traumatic experience can be, in some circumstances,

cathartic (i.e., relief; Harber, Pennebaker, & Christianson, 1992). Perhaps the emergence of this particular hashtag movement, even though tweets did not explicitly endorse relief, may have been functionally supportive by providing relief to those who participated.

Table 1. Indicators within the language network identified by the information centrality measure.

Index	Domain	Information Centrality
Weak	Power	7.56
Physical well-being	Outcome	7.23
Relief	Emotion	7.23
Anxiety	Emotion	7.06
Active	Power	6.89
Psychological well-being	Outcome	6.89
Kinship	Social Support	6.71
Affiliation	Social Support	6.49
Shame	Emotion	6.47
Joy	Emotion	6.47
Well-Being gain	Outcome	6.27
Passive	Power	6.27
Power	Power	6.04
Strong	Power	6.03
Enlightenment gain	Outcome	6.03
Affect gain	Outcome	6.02
Fear	Emotion	5.19
Respect gain	Outcome	5.19
Hope	Emotion	4.85
Sadness	Emotion	4.83
Anger	Emotion	4.03
Power gain	Outcome	3.06

Discussion

Hashtag movements can give voice to traditionally silenced groups. As such, we sought to identify the ways in which individuals discussed barriers to disclosing sexual violence using the Twitter movement #WhyIDidntReport. Results from the content analysis highlighted prior negative disclosure experiences, especially reactions that minimized one's experience (c.f., DARVO; Freyd, 1997), as a significant barrier to future reporting/disclosing. Though these

results largely replicate existing research identifying experience minimisation as a barrier, participants in the #WhyIDidntReport movement did not minimise their own experience (i.e., express that their experience was not 'bad enough' to be considered sexual assault) to the same degree. This novel finding suggests that networked communication (i.e., the hashtag movement) validated individual experience. Furthermore, the NLP and network analyses extrapolated the psychosocial processes that were most prevalent (i.e., power themes) and those that seemed to tie the movement together (i.e., providing relief and catharsis). Thus, we argue the #WhyIDidntReport hashtag movement not only provides evidence for explicit self-reported barriers to disclosing sexual violence, but also creates an online community through which people seek, provide, and experience belonging and healing via participation.

Barriers to Disclosure

Five superordinate themes were identified from the content analysis: *intrinsic motivation for nondisclosure (e.g., shame, self-blame, and delayed realization), Fear of disclosure outcomes (e.g., fear of not being believed, protect perpetrator), Disclosure history, Systemic barriers (e.g., distrust of police, perpetrator is person in power),* and *Information regarding the sexual assault (age and relationship to perpetrator).* These themes are consistent with prior research regarding barriers to reporting to law enforcement in a college sample (Sable et al., 2006), barriers to disclosing childhood sexual abuse (Alaggia, Collin-Vezina, & Lateef, 2019), and reasons for nondisclosure amongst female victims of sexual assault (Carson et al., 2019). Yet, these barriers should also be contextualized in that hashtag movements reflect the influence of social networking sites on lived experiences for sexual violence survivors.

Of the 500 #WhyIDidntReport Tweets included in the content analysis, 78% contained a disclosure of sexual violence and an identified disclosure barrier. Interestingly, the disclosure rate here appears to be much higher compared to an analysis of #MeToo tweets from the 2 weeks following the 2017 revitalisation of the #MeToo movement. Gallagher and colleagues

(2019) reported only 46.2% of the 2,500 Tweets tagged with #MeToo and analysed were disclosures of sexual violence. This discrepancy likely reflects the different function of the two hashtag movements. Future research should examine public perceptions and ideological shifts associated with different hashtag movements or motivations for participation.

Consistent with previous research (e.g., Carson et al., 2019; Sable et al., 2006; Zinzow & Thompson, 2011), *shame/embarrassment* and *self-blame* were identified as barriers to disclosing. Given the prevalence of rape myths and victim blaming, an experience of sexual violence can lead to further silencing due to shame arising from attributing blame to the victim (Ullman, 1996). Similarly, the *fear of disclosure outcomes* (e.g., *fear of not being believed* and *fear of retaliation by the perpetrator*) were highly represented in our sample (McMahon & Seabrook, 2019). These barriers are particularly insidious as they are directly related to the disclosure event itself. In fact, 2.8% of participants in the movement said that reporting their sexual assault was simply *not worth the trouble*. This theme, however, was only endorsed in reference to reporting to law enforcement with individuals stating that reporting would cause more trauma. Thus, the present study provides additional evidence for the emerging idea that institutional betrayal and systematic barriers should be addressed to minimize the negative health outcomes associated with sexual violence (Smith & Freyd, 2013).

Though less represented in the sexual violence literature, some tweets cited a negative previous disclosure, either personally or second hand, as influencing their decision to be silent. Research on concealable stigma disclosure more broadly has found that a negative disclosure experience often leads to fewer disclosures in the future (Chaudoir & Fisher 2010; Chaudoir & Quinn, 2010); however, to our knowledge, this is the first report to explicitly identify a negative second-hand disclosure experiences as a barrier to disclosing one's personal victimization. Although empirically novel, it is unsurprising given that witnessing a non-supportive disclosure would likely contribute to the anticipated social support one could expect

themselves. As such, it is crucial that future research is dedicated to understanding how seeing other's positive disclosures experience might impact one's own disclosure decision in the future.

Researchers have also found that women are more likely to report to formal support providers if the assault conforms to stereotyped notions of rape such as assault by a stranger (i.e., is rape-myth congruent; Starzynski, Ullman, Filipas, & Townsend, 2005). This was supported by the 29% of tweets that identified a known perpetrator and cited this as a reason to not report. Oftentimes, these perpetrators held a position of power over the victim. For example, within this theme, individuals identified family members, employers, and doctors as perpetrators of the abuse. The cyclic effect of silence when an abuser is a person in power is well-documented in the literature (e.g., Armstrong, Gleckman-Krut, & Johnson, 2018; Eiler et al., 2019). Power and age compound in that age is consistently identified as a predictor of sexual assault disclosure with many victims of childhood assault delaying disclosure into adulthood (Alaggia et al., 2019). As alluded to before, situations in which power dynamics exist between adults and children should be examined for potential risk and mitigation.

Another reason for delayed disclosure in both child and adult sexual assault victims is a delayed realization that what happened qualifies as an assault (Schaeffer, Leventhal, & Asnes, 2011). In 8.4% of the current sample, individuals were confused about what happened and did not label their experience as assault until years later. Again, because this situation is rape myth incongruent (i.e., rape should be reported immediately) it functioned as a barrier to disclosure. This finding highlights the importance of consistent and robust sexual education considering formal instruction regarding sex and consent in high school has been identified as a protective factor against sexual assault in University (Santelli et al., 2018).

Relatedly, minimisation of a sexual assault experience (e.g., 'I didn't think it was 'bad enough' to count as sexual assault') has also been empirically identified as a disclosure barrier.

Carson and colleagues (2019) found that, of 56 women who had never disclosed a sexual assault experience to anyone, 43% stated that their reason for concealment was because their assault 'was not a big deal' or 'wasn't of big importance.' Interestingly, this finding was not supported by the current data. Few #WhyIDidntReport tweets (2.2%) endorsed this theme.. This discrepancy is likely due to the fact that the previous study analysed barriers to disclosure for individuals who had *never* disclosed, whereas it is unclear how many times the participants in the #WhyIDidntReport movement have disclosed. Another optimistic interpretation could be that these online movements allow individuals to acknowledge that their experiences and feelings around them are legitimate—to normalize their experience and feel less alone. Future research should work to understand participation in hashtag activism related to sexual assault, and whether those who have revealed in the past are more likely to contribute to online activism through self-disclosure as well as identify any psychosocial outcomes related to participation.

Finally, it is interesting that themes around the justice system—*Disbelief in successful prosecution* (2.4%) and *Dislike or distrust of police and justice system* (5.6%)—were relatively less endorsed in #WhyIDidntReport tweets compared to other barriers. Celebrities and prominent figures began using the hashtag #WhyIDidntReport in response to a Donald Trump tweet suggesting Dr. Christine Blasey-Ford would have seen swift legal action if she had reported in 1982. While these themes were certainly present in the analysed tweets, results suggested people are silenced both within and outside of the justice system. Therefore, future work should seek to examine how hashtag movements shift in scope to meet the needs of their participants as they emerge over time.

Underlying Language Structure of #WhyIDidntReport Movement

The NLP procedure and network analysis addressed semantic features of the #WhyIDidntReport movement. These analyses identified sentiment related to power (both gain and loss)—*active, strong,* and *passive*—as being most represented within the sample of

#WhyIDidntReport tweets. In an analysis of Victim Impact Statements from the 2017 trial of Larry Nassar, sentiment regarding *power* was also highly represented and influential in the language network (Eiler et al., 2019). As the #WhyIDidntReport movement emerged to combat false beliefs about sexual violence and law enforcement response, it is not surprising that the power related domain was influential, as those in power have the ability to silence survivors more efficiently than those with less influence. Conversely, sentiment related to disclosure outcomes such as *power gain* and *well-being gain* were relatively less endorsed. This is likely due to the nature of the movement which emerged as a way for people to identify reasons for non-disclosure, not discuss ways in which disclosing sexual abuse provided support and well-being. These results support the body of literature that identifies social support following a disclosure of traumatic, stigmatizing experiences as improving perceived control over recovery, and is also associated with PTSD symptom reduction (Ullman & Peter-Hagene, 2014). Given that those who participated in the movement were previously silenced, this silence and loss of control was reflected in the collective structure of the language network.

The current sample elucidated *fear, sadness,* and *anger* in the emotion domain whereas *hope, anxiety,* and *relief* were nearly non-existent. This is particularly interesting considering *physical well-being*, *anxiety*, and *relief* were all highly influential to information flow through the language network. Though largely exploratory, this language network may highlight how language structure can facilitate a shared sense of relief and normalization of experience through the development of counterpublics meant to support those who have experienced sexual abuse (Gallagher et al., 2019). This phenomenon has been well documented in other contexts, as the expressive writing paradigm (writing about a stressful experience; Pennebaker & Beall, 1986) has been shown to improve both physical and psychological well-being. For example, Ernala and colleagues (2017) found that disclosures of a schizophrenia diagnosis on Twitter were followed by reduced discussion of stigma experiences. Therefore, participating

in hashtag activism and collective online disclosure may provide some relief from the trauma associated with concealing a stigmatised identity more broadly. Future work should investigate the impact of exposure to, and participation in, sexual violence disclosure movements on long term social media activity. More research is needed to characterise the networked function of online movements, and the long-term individual consequences of their participation.

Limitations and Future Directions

Considering the complexity of naturalistic Twitter data, there are some limitations to address. First, though the #WhyIDidntReport movement emerged to share factors that inhibit reporting sexual assault to formal support providers such as law enforcement, it is unclear whether each participant identified barriers to disclosing to law enforcement, health care professionals, or to informal support providers such as friends and family. Based on the qualitative content analysis, many discussed barriers to disclosing generally, however, as we cannot confirm the intended audience, this remains unknown. Next, we do not know demographic information of those who participated in the #WhyIDidntReport hashtag movement. One report classified Twitter users in the United States as younger, more educated, and more likely to identify as Democrat than the general population (Wojcik & Hughes, 2019). Furthermore, by excluding Tweets authored in languages other than English, we likely systematically silenced voices that could speak to disclosure barriers that reflect cultural intersectionality. Natural language processing algorithms that examine languages beyond English would be helpful for addressing concerns about generalisation and cultural variation.

With these limitations in mind, there are numerous avenues for additional research to address. First and foremost, researchers should take an intersectional approach when examining barriers to disclosing sexual violence. This could be accomplished by analysing tweets or online support communities authored in languages other than English, though a paucity of natural language processing algorithms address non-English text (though the

Linguistic Inquiry and Word Count could begin to address this question; Pennebaker, Frances, & Booth, 2001). Cultural values of modesty and shame surrounding sex and sex education often result in delayed disclosures of abuse, particularly for children (Fontes & Plummer, 2010) and thus, future research should also examine the impact of online participation with hashtag movements on in person sexual violence disclosure, particularly for non-white and non-cisgender individuals. Lastly, it remains an empirical question as to whether all hashtag movements have similar underlying language structure or whether these results should be bounded to this particular topic.

Conclusion

Hashtag movements bring traditionally silenced voices into the foreground and provide a new social affordance that facilitates belonging and experience normalization. Moreover, these movements provide researchers and practitioners insight into the individual and collective experiences of these traditionally silenced groups. Through an analysis of tweets tagged with #WhyIDidntReport, we identified a range processes that repressed the disclosure of a sexual violence experience. Namely, age at the time of abuse and relationship to the perpetrator were consistently cited as motivation for silence. We also found prior negative disclosure experiences, both personal and second hand, to reduce disclosure motivation. The language networks revealed *relief*, *weakness,* and *physical well-being* as central features of the semantic network. Though largely exploratory, the NLP and network analyses provide insight into the function of language use in networked hashtag counterpublics. Therefore, researchers, clinicians, and practitioners should consider the role of hashtag activism and online communities within the landscape of sexual violence disclosure, and its utility to break down barriers.

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Chapter 5: Sexual Violence Disclosure Barriers

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Supplementary Material: Table S1. All language indices from SEANCE included in network analysis.

Disclosure Dimensions	Index	Definition	Words	Dictionary
Emotion Dimensions	Anxiety	Negative Emotion words	anguish*, anxi*, apprehens*, diffiden*, jitter*	GALC
	Shame	Negative Emotion words	abash*, asham*, crush*, disgrace*, embarras*	GALC
	Hope	Positive emotion words	buoyan*, confident*, faith*, hop*, optim*	GALC
	Relief	Positive emotion words	relie* ,	GALC
	Anger	Negative Emotion words	expletive, inept, unfulfilled, lynch, agitation	EmoLex
	Fear	Negative Emotion words	smut, measles, lynch, militia, servile	EmoLex
	Joy	Positive emotion words	tantalizing, felicity, lovable, unbeaten, superstar	EmoLex
	Sadness	Negative emotion words	measles, inconsequential, unfulfilled, lynch, gray	EmoLex
Power Dimensions	Strong	Dominance, respect, money, and power	ability, able, abolish, abominable, abrasive	General Inquirer
	Power	Dominance, respect, money, and power	abolish, accomplish, accomplishment, accord, achievement	General Inquirer
	Weak	Dominance, respect, money, and power	abandon, abandonment, abdicate, abject, abscond	General Inquirer
	Active	Effort	abide, abolish, abscond, absolve, abuse	General Inquirer
	Passive	Effort	abate, abdicate, abhor, abject, abound	General Inquirer
Outcome Dimensions	Psychological Well-being	Cognition	adjust, afraid, amusement, anger, angry	Lasswell
	Enlightenment Gain	Cognition	account, acquaint, address, air, analyze	Lasswell
	Power Gain	Dominance, respect, money, and power	accede, agree, aid, allow, appease	Lasswell
	Respect Gain	Dominance, respect, money, and power	acknowledgment, admire, apologize, appreciate, approve	Lasswell
	Physical Well-being	Physical	air, alive, ambulance, ankle, ate	Lasswell
	Affect Gain	Positive emotion words	affair, ask, associate, care, caress	Lasswell
	Well-being Gain	Positive emotion words	amelioration, amuse, attend, ball, casework	Lasswell
Social Dimensions	Affiliation	Social Relations	abide, absorption, accede, acceptance, accompany	General Inquirer
	Kinship	Social Relations	ancestor, aunt, bride, brother, cousin	General Inquirer

Note. Asterisks (*) identify word stems used to identify sentiment within each language dictionary. Words in the "Word" column are examples, not comprehensive.

Supplementary Material: **Table S2.** Final codebook and prevalence of each theme.

Superordinate Theme	Code	Example	Percent of Total (389 Tweets)	*n*
Intrinsic motivation for nondisclosure	Shame, Guilt, Embarrassment	*I didn't report because I was humiliated and ashamed.*	12.3%	48
	Self-Blame	*Because I put myself in situation by agreeing to go home with him.*	15.9%	62
	Desire to forget	*I didn't tell anyone cause I wanted to forget.*	4.1%	16
	Discounting personal experiences	*I don't talk about it because it is not big, I guess, still some kind of sexual harassment.*	2.8%	11
	Delayed Realization	*I didn't know what happened to me was wrong until years later.*	10.8%	42
Disclosure Outcomes	Fear of retaliation by perpetrator	*Because it was my boss and I did not want to jeopardise my job.*	8.2%	32
	Fear of not being believed	*Because I'm still afraid I'd be called a liar if I told anyone.*	20.8%	81
	Protect perpetrator and their friends/family	*His parents told me he would not go to Heaven if I told, and that it would be my fault.*	4.6%	18
	Protect friends/family from knowledge of abuse	*I didn't want my mom to think it was her fault for the trauma I endured.*	4.9%	19
Disclosure History	Negative previous disclosure	*Because when I told my mom, she said it was just a rough patch that I would get through.*	14.4%	56
	Negative disclosure second-hand	*It wouldn't have mattered if I reported mine. My sister did and nothing happened.*	1.0%	4
Systemic Barriers Information regarding experience	Disbelief in successful prosecution	*My diagnosis probably means that my testimony would be inadmissible.*	3.1%	12
	Lack of knowledge about how to get help	*He was my boyfriend and I didn't know that I could report it.*	2.6%	10
	Dislike or distrust of police and justice system	*I knew the police weren't going to do anything so I saved myself the embarrassment.*	7.2%	28
	Cultural or language barriers to obtaining help	*I am autistic and I communicate differently.*	1.0%	4
	Perpetrator was person in power	*He was my professor and he told me he had a lot of power in the department.*	12.6%	49
	Reporting not worth the trouble	*I didn't want to go through a legal ordeal, even with proof, I didn't have the energy for it.*	3.6%	14
Information regarding experience	Age of experienced abuse	*Because I was 5, again when I was 18.*	42.2%	164
	Relationship with perpetrator	*Because he was my boyfriend and I loved him.*	37.3%	145
Not included in content analysis (Percent total out of 500 tweets)	Allyship	*#WhyIDidntReport may be the most profound trend on Twitter*	16.8%	84
	Maligning movement	*What ever happened to innocent until proven guilty in a court of law?*	1.6%	8
	Not personal disclosure	*I have a friend who was raped by her father as a child.*	2.2%	11
	Miscellaneous	*Protected in dreams, exposed as we sleep.*	1.4%	7

Addendum to Chapter 5

This final paper in this thesis rounded out the project as a whole by exploring disclosure at the structural level. The hashtag movement #WhyIDidntReport and others like it provide a relatively safe space for individuals to share their experiences, while also participating in a collective disturbance against public stigma. In this paper we sought to identify the ways in which individuals discussed barriers to disclosing sexual violence, as well as the psychosocial semantic network which bond the tweets together. Results from the content analysis were generally consistent with those identified in prior work (e.g., power, distrust in the justice system, shame). However, participants in the #WhyIDidntReport movement were less likely to minimise their own experience compared to previous research perhaps pointing to the utility of networked counterpublic movements in validating individual's experiences. The NLP and network analyses extrapolated the psychosocial processes that were most prevalent (i.e., power themes) and those that seemed to tie the movement together (i.e., providing relief and catharsis). Furthermore, this final paper reflected the ways in which social media and human computer interaction provide a virtual space for a disclosure to occur. The next chapter provides an overall discussion to this body of work and considers the existing limitation and subsequent future directions.

Chapter 6

Discussion, Limitations, and Conclusion

Chapter 6: Discussion

General Overview

This thesis presented four papers which provide the framework for a program of research that investigates the stigma disclosure experience in a dynamic, multimodal, and multimethod approach. While each paper was motivated by distinct aims, the overall purpose of this thesis was to ground the CSI disclosure process within the individual, dyadic, and structural context of the social and cultural systems. Paper I was the first of its kind to analyse the content of a CSI disclosure from a simulated disclosure event and highlighted the importance of communicated social support and post-disclosure goals. Paper II explored the dynamics of movement and language use during the simulated disclosure and revealed differential movement patterns as a function of goal motivation while language use differed during close other and professional other disclosures. These two papers together provide a deeper understanding of the ways people share deeply personal information about themselves. Paper III extended the previous work to investigate the behavioural dynamics and attitude change of the perceiver (i.e., the disclosure confidant). Though the movement results were tenuous, this paper framed CSI disclosure as a perturbation to a dynamical system. Finally, paper IV used data from the hashtag #WhyiDidntReport to identify the self-reported barriers to sexual violence disclosure as well as the networked language structure within the online movement. Though these papers present the disclosure process at different scales, as a whole they demonstrate that both stigmatization and disclosure interact within and between the intrapersonal, dyadic, and structural levels.

Key Findings

Through a thematic analysis of simulated disclosure events, the first paper introduced and described in depth how people share a wide range CSIs including mental health disorders, gender and sexual minority identities, and history of experienced sexual violence. An analysis of the simulated disclosures revealed that participants shared *identity specific information,*

Chapter 6: Discussion

reasons for previous concealment and current disclosure, anticipated response of the confidant, and *interpersonal post-disclosure goals*. These results highlight the importance of communicated social support and post-disclosure goals when someone reveals a CSI. Further, this study provides support for the Disclosure Processes Model (Chaudoir & Fisher, 2010) which suggests that activation of approach and avoidance motivation influences the content of a CSI disclosure. As with paper II, antecedent motivation influenced behaviour at multiple levels. According to dynamical systems theory, fast timescale processes—in this case postural activity and language use—are constrained by slower timescale processes; here, that is antecedent motivation. Therefore, a shift in motivation or psychological states may propagate throughout the lower levels of the system to influence behaviour. Future research should work towards investigating how this system is impacted by the inclusion of a disclosure confidant.

Another aim of this study was to examine the differences in disclosure content in close and professional contexts. Surprisingly, when disclosing to a professional other, participants were more likely to express the desire to shift their relationship from professional to more personal. On the other hand, when disclosing to a close confidant—particularly family members—participants did so to improve a relationship that had deteriorated. This finding is consistent with existing work that points to the crucial role of social support on well-being (Beals, Peplau, & Gable, 2009; Yeshua-Katz, Rains, Peterson, & Wright, 2020), while also demonstrating the importance of context on the disclosure decision making process.

Paper II presented unintentional movement and language dynamics from the simulated disclosures described in the previous chapter. The aim of this paper was to provide a deeper understanding of the ways in which situational context and motivational states are embodied across multiple behavioural processes during a CSI disclosure event. Importantly, these data reflect nonverbal behaviour beyond discrete posturing (e.g., eyebrow raise, crossed arm) through the use of nonlinear analytic techniques. Results suggested that antecedent goals are

embodied in postural activity such that participants instructed with approach goals exhibited more complex structure whereas avoidance instruction resulted in more deterministic, Brownian motion. Research suggests that loss of complexity reduces behavioural adaptability in postural control (Manor et al., 2010). According to approach/avoidance motivational systems theories, when avoidance-orientation is activated, individuals are more attuned to negative stimuli (Roskes, Elliot, & De Dreu, 2014). Therefore, a focus on the potential for stigmatization and discrimination may constrain the agent-environment system and reduce adaptive exploration of stable states.

Next, results of the categorical RQA of the words used during a disclosure event revealed a significant effect of disclosure context, such that close other disclosures were characterised by more overall recurrent words than to professional others. While participants repeated the same words to close other confidants than professional other confidants, they did not use significantly longer phrases which suggests that they shared more unique identity related information to close others than to professional others. Along with paper I, these results provide support for selectivity or flexibility in disclosure and adds to the growing body of research which highlights the function of flexibility in disclosure decisions on well-being (Legate, Ryan, & Rogge, 2017; Lyby et al., 2019).

Paper III responded to the limitations (i.e., the lack of a disclosure confidant) of the previous two chapters by investigating interpersonal dynamics following a spontaneous disclosure. This paper framed stigma disclosure as a perturbation to a complex system resulting in both immediate relationship ambiguity and the emergence of new stable behavioural states. In this study, participants viewed the CSI disclosure of a confederate and interpersonal coordination and movement dynamics was measured. Surprisingly, coordination during the rhythmic arm movement task was not impacted by stigma disclosure. Spontaneous coordination was predicted to reduce following a CSI disclosure as stigma generally disrupts a

dyadic interaction. However, one interpretation of spontaneous synchronization is that coordination may facilitate cooperation within dyads and reduce intrinsic differences (Miles, Lumsden, Richardson, & Macrae, 2011). Therefore, it is unclear from these data if coordination following a CSI disclosure emerged to enable smooth interaction, or if the stigma disclosure was not salient enough to perturb the system away from stable behaviour.

However, participants in the first study of this paper demonstrated greater avoidance behaviour away from the confederate in a collision avoidance task following a depression disclosure. This is consistent with previous work on mental illness stigma which suggests that individuals exhibit social distancing (avoidance behaviour originally hypothesised to reduce disease transmission) towards people with a mental health disorder. Results of this chapter should be interpreted with caution given the small sample size in each study. Further, research in this domain should recruit participants outside of psychology research pools to reduce suspicion towards the research confederate, as well as to better represent the general population outside of a university setting. In all, the studies presented in this paper provide the groundwork for framing CSI disclosure as a perturbation within a dyad.

Of the papers in this work, the fourth paper was the only one investigate disclosure in the naturalistic context. This paper employed two traditions within language analysis; namely, a qualitative content analysis which described the self-reported reasons for concealment of sexual violence and the semantic analysis and network analysis which depicted the structure of language and communication that exists within the online movement. Consistent with the extant literature (see Carson et al., 2019; Sable, Danis, Mauzy, & Gallagher, 2006; Zinzow & Thompson, 2011), themes of shame and embarrassment associated with sexual trauma and self-blame placed on victims/survivors due to rape myths were highly represented in these tweets. However, whereas previous qualitative work has identified a discounting of personal experience as the most endorsed reason for non-disclosure (Carson et al., 2019), only 2.8% of

tweets analysed here endorsed that theme. This surprising finding may demonstrate the function of hashtag activism in validating the experiences of typically stigmatized and silenced individuals (Gallagher, Stowell, Parker, & Welles, 2019). Therefore, future work should aim to better understand motivation for online disclosure and participation in hashtag movements compared to dyadic disclosure. Further, the network analysis of semantic language represented in these tweets revealed the underlying motivations of *relief* and *physical-wellbeing* embedded in this hashtag movement. Whereas the previous papers explored disclosure as a perturbation at the intra- and interpersonal levels, this final paper identified wide-reaching, largely accessible hashtag movements as agitating the stigma process at the structural level.

Limitations and Future Directions

Though this thesis strived for a holistic approach to the disclosure process, there are methodological and analytical limitations to address when interpreting these results. The first two papers presented the information provided by someone disclosing a CSI. However, this study asked participants to share their CSI to an imagined other, resulting in a monologue style disclosure. Though imagined interactions have demonstrated to be useful in reducing communication apprehension (Honeycutt & McCann, 2017), these data do not directly speak to the dyadic nature of self-disclosure. Interpersonal interaction allows for rich flow of information between two co-acting individuals which influence both movement and language. For example, individuals in a dyad tend to spontaneously entrain both acoustic onset (Abney, Paxton, Dale, & Kello, 2014) and movement dynamics (Shockley, Santana, & Fowler, 2003) with their conversation partner. As such, while these results provide support for the embodied nature of disclosure context, future research should aim to capture the interpersonal disclosure process using more naturalistic means. This is not only a limitation to the work described above, but an overarching limitation within the CSI literature as a whole. This reflects the ethical considerations that must be made when undertaking this work. As the process of

stigmatization can lead to social devaluation, researchers in this field must strive to minimise distress that participants can experience by revealing their CSIs. As such the utilization of virtual avatars and virtual reality may prove fruitful in capturing dyadic exchange.

Another limitation within the first two papers is the unintended, though not surprising, result of the instructions given to participants when choosing their disclosure confidants (see the supplemental method following chapter 3). As we wanted the simulated disclosures to be genuine, participants were instructed to "Think about a [close friend/professional acquaintance] who you [the participant] would consider telling this secret to." This instruction resulted in participants disclosing to people whom they already anticipated a positive response, with 75.78% of CO confidants and 90.91% of PO confidants rated as being either somewhat supportive or very supportive following a potential disclosure. This is important, as social support is one of the strongest predictors of well-being following a disclosure event (Beals, et al., 2009). These results, then, likely reflect language and behavioural dynamics when anticipated support is already high. Next steps in this domain would be to characterise the disclosure process when the fear of negative reactions may be more salient.

Though paper III responded to some of the restrictions in the previous project, namely the lack of response of the disclosure confidant, the studies presented were still limited by lack of interaction during the actual disclosure event. In order to control for variation in the disclosures of a bisexual identity and depression diagnosis between participants, the confederate was pre-recorded, as such, these data still lack the bidirectional coupling necessary in an interpersonal disclosure. The results of the two studies presented in this paper should also be considered with caution considering the small sample size, and the overall suspicion participants demonstrated in study one. This lends further credence to the growing call for research that does not recruit W.E.I.R.D. (Western, Educated, from Industrialized, Rich, and Democratic countries) participants. The field of CSI disclosure as a whole would benefit from

Chapter 6: Discussion

recruiting samples outside of the psychology participant pools, particularly when the research involves deception.

The fourth and final paper presented in this thesis addressed the previous limitation of convenience sampling methods by analysing naturalistic and publicly available tweets using the hashtag #WhyIDidntReport. While anyone over the age of 13 with access to an internet connection and an email can create a Twitter account, a recent PEW Research Center report found that the majority of its active users may fall into the W.E.I.R.D category (Wojcik & Hughes, 2010). Furthermore, tweets that were not authored in English were removed from the sample, likely biasing our results. A natural next step would be to identify unique barriers to sexual violence disclosure experienced across and within the structure of different cultures. This intersectional approach is crucial to conducting research on stigma as the implications of this work and resulting policy initiatives may further harm and silence those who were systematically excluded from participation. Therefore, future research may also take a community based participatory approach to understand the disclosure process and subsequent health outcomes within disparate communities.

Finally, in both papers (I and IV) presenting qualitative analyses, we were unable to directly include the participants in the interpretation of the results. In traditional qualitative methods, researchers and participants are encouraged to communicate and confirm the interpretation of the data when analysing results to avoid researcher bias leading to misconstruing participant responses (Creswell & Poth, 2016). As the simulated disclosures presented in paper I were taken from a larger quantitative study, and participant responses were confidential, researchers were not able to contact the participants to confirm the interpretation of results. Furthermore, as institutional ethics was not necessary to analyse the tweets included in the fourth paper, researchers were not allowed contact with the authors of the tweets. Though the interpretation of the data were grounded in existing research on the disclosure process,

results may be biased by my own experience with CSI disclosure, as well as the experiences of my co-authors. As suggested above, future research should directly involve community stakeholders in conducting this research to allow for more robust interpretation.

Conclusion and Implications

Drawing from experimental and naturalistic data analysed using quantitative nonlinear methods (i.e., DFA, RQA, cross-spectral coherence, and network analysis) and qualitative (i.e., thematic and content analysis) analytic techniques, this thesis took a multimethod approach to investigate and describe the CSI disclosure process. Taken together, this body of work both describes the experience of disclosing a CSI across contexts (close other and professional other relationships; and dyadic and social media disclosure), and introduced novel experimental methods to investigate every day, social phenomena.

This was the first published study to employ a simulated disclosure event to characterise language use and behavioural dynamics during a CSI disclosure event. These methods provide a promising avenue to safely and ethically investigate the disclosure process in a controlled setting. Furthermore, the results of the first two papers demonstrate the influence of antecedent goals on postural behaviour and disclosure depth. As approach and avoidance motivational systems can be experimentally induced (Friedman, Deci, Elliot, Moller, & Aarts, 2010), clinical applications could use both a simulated disclosure and approach activation to prepare individuals who wish to disclose their CSI with others. Indeed, these techniques are also accessible to the general population. In fact, one participant from the first study, who was in the approach condition, asked to have a copy of her written letters for future reference (note, this was approved by the Institutional Review Board before access was given).

Next, the initial results of the third paper provide some insight into the impact of stigma disclosure on the confidant. Surprisingly, whereas attitudes towards stigmatized groups did not change following a disclosure and cooperative action, rapport did improve. While research

suggests that intergroup contact can serve to reduce stigmatization (Dovidio, Gaertner, & Kawakami, 2003), the results in the present study are in line with previous work that suggests that interaction is not enough to improve attitudes. In a study in which participants were interviewed in two waves—each one year apart—heterosexual identifying participants who did not know any sexual minority individuals at wave one, and stated meeting at least one sexual minority individual at wave 2, did not display a change in attitudes (Herek & Capitanio, 1996). Therefore, while paper III adds to the growing body of literature that coordination may rapport and reduce social distance (Lakens & Stel, 2011), the experimentally manipulated disclosure and subsequent interaction may not have been salient enough to result in attitude changes, even temporarily. While a CSI disclosure may be unexpected, especially in a research setting, it may not be enough to perturb interpersonal interaction at first meeting, particularly when the need for cooperative action to successfully complete task demands is relatively low.

Finally, the last paper presented in this thesis demonstrated the importance of emerging online communities and hashtag activism in raising the voices of those traditionally silenced due to structural and public stigmatization. Importantly, those who shared their barriers to disclosing sexual violence did not downplay their experiences to the same degree as previous research has found (Carson et al., 2019). Therefore, these social media movements may serve to empower the individual participants while also disrupting the structures at play that have systematically silenced these individuals. These results also provide more evidence to the extant literature that highlights the insidious nature of power dynamics in silencing those who experience sexual trauma.

Altogether, this thesis described the process of CSI disclosure within and between multiple levels of the stigma process as defined by Pryor and Reeder (2011), and through the lens of dynamical systems theory. This approach is not only useful empirically, but has far reaching implications for the development of interventions at each level of the disclosure

process. At the intrapersonal level, a simple shift in psychological motivation could distribute changes across the entire system, giving rise to flexible behaviours and potentially a more positive response from the confidant. Individual level behaviour, however, must be considered within the context of the system as a whole. With disclosure events propagating across each level of the stigma process, these individual and interpersonal level disclosures may serve to disrupt the system as a whole, leading to wide-reaching, sometimes global movements—such as #WhyIDidntReport—which can influence systemic changes in public stigma beliefs.

Chapter 6: Discussion

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Chapter 6: Discussion

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Appendix A-C of this thesis have been removed as they may contain sensitive/confidential content