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**Centre for Technology Entrepreneurship
Technical University of Denmark**

PHD THESIS

For Richer or Poorer, Better or Worse? Exploring How Conflict and Emotions Impact Start-up Team Separation

NICOLA THOMAS

For Richer or Poorer, Better or Worse? Exploring How Conflict and Emotions Impact Start-up Team Separation

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PhD Thesis
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ABSTRACT - ENGLISH

Entrepreneurship is an incredibly emotional journey, and nowhere are the emotional dynamics in a founder's journey more pronounced than in founding teams. While research into founding teams has flourished in recent years, we know surprisingly little about how conflict and emotions interact in founding teams to impact the likelihood of a founding team separation. Yet practitioners rely on the metaphor of marriage to teach founders how to manage conflict and affect to avoid a team 'divorce', however no entrepreneurship research explores this metaphor empirically to assess the validity and appropriateness of comparing a founding team to a marriage. In this thesis, I argue that to explore these complex phenomena in a rich, nuanced way, we need to deviate from traditional theories and methodologies relied on in entrepreneurship research. Hence, I draw inspiration from marital research, and capitalise on recent technological advancements like artificial intelligence algorithms that monitor real-time valence and activation fluctuations throughout founding team interactions. I explore the role of conflict, affect and affective interactions that lead to co-founder exits and founding team separation in a novel way.

This thesis consists of three core articles that employ a range of methodological approaches to examine, and predict, how founding team dynamics lead to co-founder exits over the long run. I propose a theoretical framework that posits three main, interconnected findings. First, there are a range of affective responses throughout founding team conflict, and contrary to expectations, negative affect is not only expressed in relationship conflict, but also task and process conflict. Second, patterns of group affect and group cognition change the nature of team interactions, which in turn influence team conflict and resulting co-founder exits. Finally, rather than negative affect and relationship conflict predicting a co-founder exit, positive affect and task conflict are highly predictive of a founding team separation.

Taken together, in this body of work I contribute to the literature on *entrepreneurial affect, entrepreneurial exits,* and *founding team conflict* by challenging core assumptions about the deleterious role of negative affect and relationship conflict in founding teams. I introduce important new insights about what impacts founding teams in the long run: namely, how affective heterogeneity and 'masked positivity' increase the likelihood, and detriment of a co-founder's exit.

Keywords: Founding team, team conflict, affect, co-founder exits, entrepreneurial affect, team dynamics

ABSTRACT - DANISH

Iværksætteri er en følelsesladet rejse, og den følelsesmæssige dynamik er yderst nærværende for de iværksættere som er en del af et founder team. Selvom forskning i founder teams er vækstet de seneste år, så ved vi overraskende lidt om hvordan konflikter og følelser påvirker founder teams og hvordan det har indflydelse på sandsynligheden for at founder teams adskilles. Mens praktikere beror på metaforer om ægteskabet når de skal undervise iværksættere i hvordan de skal håndtere konflikter og affekt for at undgå 'skilsmisser', så findes der ingen forskning som underbygger validiteten af denne metafor empirisk, ej heller hvor formålstjenligt det er, at sammenligne founder teams med et ægteskab. I denne afhandling, argumenterer jeg for nødvendigheden i at afvige fra traditionelle teorier og metoder anvendt i nuværende entreprenørskab forskning, for at kunne undersøge dette komplekse fænomen på en altfavnende og nuanceret måde. Derfor, med inspiration fra forskning i ægteskab, samt ved at inddrage teknologiske fremskridt, såsom kunstig intelligens algoritmer der monitorerer positive og negative udsving ved founder teams interaktioner i realtid, udforsker jeg den påvirkning som konflikt, affekt og følelsesladede interaktioner har på founder teams der adskilles, samt co-founder exits.

Denne afhandling består af 3 centrale artikler som anvender en række metodiske fremgangsmåder til at undersøge, samt forudsige, hvordan dynamikker i founder teamet kan lede til at co-founders over tid forlader virksomheden. I denne afhandling, foreslår jeg en teoretisk ramme som positionere tre centrale, indbyrdes forbundne indsigter: (i) der er en række affektive responser forbundet med et founder teams konflikter, og modsat det forventede, så er negativ affekt ikke kun set i forbindelse med relations konflikter, men også ved opgave konflikter (ii) mønstre af gruppe affekt og gruppe kognition ændrer karakteren af team interaktioner, hvilket har indflydelse på team konflikter og deraf følgende co-founder exits, og (iii) snarere end at negativ affekt og relations konflikt kan bruges til at forudsige om co-founders forlader virksomheden, er positiv affekt og opgave konflikter i høj grad forudsigende faktorer for founder team adskillelse.

Opsummerende, så bidrager jeg med denne afhandling til litteraturen om *entrepreneurial affect, entrepreneurial exits,* og *founding team conflict* ved at udfordre centrale antagelser om den skadelige påvirkning af negative affekt og relations konflikter i founder teams. Jeg introducerer vigtige nye indsigter om hvad der virkelig påvirker founder teams over tid: nemlig at affektiv heterogenitet og 'tvungen positivitet' øger sandsynligheden for, og skadeligheden af et co-founder exit.

Emneord: Founder team, team konflikt, affekt, co-founder exit, entreprenørskab affekt, team dynamikker

Popular Science Summary

Genius.com co-founders, Ilan and Tom, were known to have a 'complicated relationship' (Holson, 2015). After one particularly emotional argument, they turned to couple therapy in a bid to save their business (Holson, 2015). Ilan and Tom highlight a growing trend that sees co-founders turn to marriage therapy to salvage their venture. This is unsurprising considering entrepreneurship is an incredibly emotional journey, and nowhere are the emotional dynamics more intense than in founding teams. Considering the majority of ventures are founded by teams (Beckman, 2006) understanding the emotional dynamics at play in start-up teams is essential.

While start-up coaches rely on the metaphor of marriage to teach founders how to manage conflict and affect to avoid a team 'divorce' (Perel, 2020), no entrepreneurship research explores this metaphor empirically. The trend towards couple therapy for co-founders leaves many pressing, unanswered questions. Is the marriage metaphor appropriate in the entrepreneurship context? Do the emotional dynamics that predict marital divorce also predict co-founder exits? How do the emotional dynamics in marriage conflict differ from the emotional dynamics in co-founder conflict? These questions are the starting point of this thesis.

Increasing our understanding of co-founder 'divorces' is essential and pressing considering 40% of ventures will experience a co-founder leave their start-up (Hellerstedt, 2009). This can risk the long term success of the business, and potentially damage the relationship and mental health of the founders involved. In this thesis, I argue that to explore start-up teams in a rich, nuanced way, we need to deviate from traditional theories and methods typically used in research. Hence, I draw on inspiration from marriage research and capitalise on recent technological advancements like artificial intelligence algorithms that monitor facial expressions in real-time to explore the role of conflict, emotions and emotional interactions that lead to co-founder exits and founding team separation in a novel way.

This thesis consists of three core articles that employ a range of methods to examine, and predict, how founding team dynamics lead to co-founder exits over the long run. In this thesis, I propose a theoretical framework, where I suggest that there is a range of emotional responses throughout founding team conflict, yet negative emotions do not predict a relationship breakdown as they do in the context of marriage. Surprisingly, I find that co-founders who show a high level of inauthentic positive emotions are much more likely to leave their venture and experience a relationship breakdown than other founders.

This thesis has been written to fulfil the requirements of a PhD degree at the

Department of Technology Entrepreneurship at the Technical University of Denmark. This PhD was conducted over three years, from December 2018 to November 2021 and consists of the following papers:

Paper 1: Thomas, N., Lomberg, C. & Cash, P. (2020). *It's Not What You Say but How You Say It: Exploring How Affective Dynamics Impact Team Conflict.* An earlier version was presented at the Academy of Management Conference, https://doi.org/10.5465/AMBPP.2020.21003abstract The most recent version is presented in this thesis and was submitted at the Journal of Organizational Behaviour.

Paper 2: Thomas, N., Cash, P. & Lomberg, C. (2021). *Not All Exits Are Equal: How Shared Affect and Shared Cognition Impact Co-founder Exits.* The most recent version is presented in this thesis and is to be submitted at the Journal of Business Venturing.

Paper 3: Thomas, N., Lomberg, C., & Cash, P. (2021). *Till Death Do Us Part: Using The Marriage Metaphor to Predict Co-founder Exits.* An earlier version was accepted at RENT XXXV conference, 2021. The most recent version is presented in this thesis and to be submitted at the Journal of Academy of Management Discoveries.

Appended papers:

Paper 4: Thomas, N., Lomberg, C. & Alkærsig, L. (Forthcoming). *Does Neurodiversity In Founding Teams Enhance Performance? Investigating A New Type Of Diversity In New Venture Teams.* Frontiers of Entrepreneurship Research (40), 2020.*

Paper 5: Thomas, N., Alkærsig, L. & Lomberg, C. (Forthcoming). *The Sum Of Bad Habits Stays Constant: Entrepreneurship And Substance Addiction.* Frontiers of Entrepreneurship Research (41), 2021.

Additional work by the author throughout the PhD, not included in this thesis:

Stephan, U., Perez-Luño, A., Wach, D,. **Thomas, N**, Wiklund, J.,.. *COVID-19 and entrepreneur subjective well-being* (exact title hidden to maintain blind review). Special issue submission: Entrepreneurship Theory and Practice. *Revise and resubmit stage.*

Lomberg, C., Klyver, K., **Thomas, N.** *The Praise Paradox for Entrepreneurs* (exact title hidden to maintain blind review). To be submitted at the Journal of Small Business Management.

*Awarded the J.M. Veciana Best paper award at the Research into Entrepreneurship Conference 2019

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To my assessment committee, thank you to Professor Melissa Cardon, Professor Nicola Breugst and Professor Liisa Välikangas, I am so grateful to have such an incredible group of scholars reviewing my work. Your work inspired this thesis, and I am so grateful for the insightful research you have undertaken. Thank you for all you do to support young scholars, I am honored to have you on my assessment committee.

To my friends, family and partner, not only has your support made this PhD possible, but it has been an ever-constant in my life, and for that I am so grateful. Thank you to all my friends and family in NZ and the UK. A special thank you to Bethany, Monique, Jess, Becca, Jana, Nina, Susan and so many others, thank you for supporting this journey with so many pep talks. Thank you for expanding my world view.

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To my partner, Lyall, there are no words that sum up how grateful I am for you. Not only did you join me on this Danish adventure, but you have made me the person that I am. Your belief in me encourages my belief in myself, and I look forward to all the adventures ahead of us.

Lastly, to you, the reader, no matter what drew you here, thank you for your interest in this work. I hope that this thesis provides you with new insight into the role of conflict and emotions throughout the start-up journey.

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1 | INTRODUCTION

There is no doubt that affect plays a vital role in our working lives (Barsade, Brief, & Spataro, 2003), and even more so for founders starting a business (Baron, 2008) due to levels of uncertainty and risk (Baron), the intimacy between the founder and their venture (Cardon, Zietsma, Saparito, Matherne, & Davis, 2005), and the levels of personal investment (Spivack & McKelvie, 2018). Another core driver of the extremely affective context of entrepreneurship is belonging to a founding team (Klotz, Hmieleski, Bradley, & Busenitz, 2014). Teamwork is a melting pot of emotions and subjective experiences, with team members affective experiences influencing team conflict (Jehn, 1997), team cohesion (Ensley & Hmieleski, 2005), team member exit (Breugst, Patzelt, & Rathgeber, 2015), and performance (Jiang, Zhang, & Tjosvold, 2012). Hence, considering the intersection of the emotional processes in entrepreneurship *and* the affective dynamics at play within founding teams, the need to understand the affective dynamics in founding teams is evident (Baron, 2008).

Especially so considering the majority of ventures are founded by teams (Beckman, 2006) and 40% of teams will experience a co-founder exit (Grilli, 2011; Hellerstedt, 2009); co-founder exits are a known emotional stress (Shepherd, Wiklund, & Haynie, 2009). Hence, there is a black box containing numerous, complex affective processes at play within founding teams that exist between the moment of team formation and the moment of co-founder exit (Baron, 2008; Cardon & Shepherd, 2012). While important research into entrepreneurial affect has been undertaken (e.g. understanding grief entrepreneurial failure; Shepherd, 2003; Shepherd, Wiklund, & Haynie, 2009; and the nature and impact of passion; Cardon, Wincent, Singh, & Drnovsek, 2009), the majority of this research has been performed at the individual level. Outstanding and important research questions remain: why do the affective dynamics in some teams lead to a co-founder's exit, while other teams remain intact (Rouse, 2016)? Why do some teams experience high levels of negative affect throughout conflict, will others do not (Todorova, Bear, & Weingart, 2014)? How do varying levels of positive and negative affect impact founding teams in the long run (Patzelt, Preller, & Breugst, 2020)?

10 years ago scholars noted that *"we have barely begun to uncover the most interesting questions concerning entrepreneurial emotion"* (Cardon & Shepherd, 2012, p. 2). Since then, there has been significant research to better understand how entrepreneurial affect plays out in new venture teams (Breugst & Shepherd, 2017; Morris, Kuratko, Schindehutte, & Spivack, 2012; e.g. Breugst et al., 2015). Yet, the dearth of investigation into how affective dynamics lead to conflict and team member exits has prompted co-founders to turn to marriage therapists to seek advice on how to improve team functioning and avoid "co-founder divorce" (e.g.

Perel, 2019). While there may be some similarities between the co-founder relationship and the marriage relationship, there are obvious differences: some ventures are created with an exit route in mind (Gregori & Parastuty, 2021), while marriage is intended to be "till death do us part". Further, the level of intimacy required to be in a functioning team is certainly different from that required to be in a functioning marriage. Therefore, there is an urgent need to develop empirically tested theories that deal with the affective concepts entrepreneurs are already engaging with in "co-founder therapy" with marriage therapists (Holson, 2015).

Further, two recent Harvard Business Review publications that interview relationship therapists and researchers John Gottman and Esther Perel (Aarons-Mele, 2021) highlight the lack of comprehensive theories in entrepreneurship that deal with conflict, affect and team separation in a meaningful way. Both therapists offer advice on how to improve the affective dynamics within founding teams, for example by increasing positive affect, and handling founding team conflict (Perel, 2021), however none of the research underpinning the advice was performed in the context of founding teams; the research disseminated in these publications is not conducted in the context of entrepreneurship, founding teams or business more generally, but marriage. This is important as it is urgent to understand whether the findings from the context of marriage hold true within entrepreneurship.

Taken together, the majority of entrepreneurial affect research has focused on lone founders which has led to a pressing need for research that explores the black box of affective processes in founding teams. While it is known that affective dynamics can impact general team performance (Gevers, Li, Rutte, & van Eerde, 2021), cohesion (Magee & Tiedens, 2006), trust (De Jong & Dirks, 2012) and turnover (Levine & Choi, 2004), we lack research that applies these findings in the context of entrepreneurship and co-founder exits more generally. Further, in response to the paucity of research in this area of entrepreneurship, marriage therapists and researchers have applied marriage theories to the entrepreneurship without critically assessing if these theories hold true in a different context. This is problematic as there are fundamental differences between of a founding relationship and a marriage relationship. Hence, this thesis weaves together three core streams of literature: *entrepreneurial affect, founding team conflict and co-founder exits* and applies precise methodologies developed in marital research to test taken for granted assumptions about the nature of conflict, affect and team separation in founding teams. I develop new theories on why some teams remain together and some teams separate, and why negative affect is not always bad and positive affect is not always good in the context of entrepreneurial teams. This thesis contributes novel, rich and nuanced insights to the field of entrepreneurship and adds to our understanding of the profoundly emotional and affective nature of belonging to a founding team.

1.1 Definition of key terms

Before defining the conceptual boundaries of the key theoretical concepts discussed in this thesis (section 1.2), I delimit the focus of this thesis by defining the key terms used: founding teams, co-founder exits and affect. There is a huge variety in the terms used to describe founding teams (Beckman, 2006). These range from new venture team (Klotz et al., 2014) to start-up team (e.g. Franke, Gruber, Harhoff, & Henkel, 2008). In this thesis I use the terms '*founding team*' and '*new venture team*' interchangeably, both of these terms refer to the same entity (Knight, Greer, & De Jong, 2020). By 'founding team' and 'new venture team', I mean the team that owns equity, has autonomy is their decision making and is considered a coherent entity by others (Knight, Greer, & De Jong, 2020). The other key term to define is '*co-founder exit*'. Co-founder exit, also called entrepreneurial team member exit (Gregori & Parastuty, 2021), describes the process in which one or more co-founders leave a founding team. This type of exit is a subset of entrepreneurial exits more generally (Gregori & Parastuty, 2021; Piva & Rossi-Lamastra, 2018). Yet, given my focus on founding teams I use 'co-founder exit' to explain when one co-founder exits a venture or 'founding team separation' when one or more co-founders exits the venture and the founding team separates. These terms reflect the delimitation of this thesis whereby I am not focused on lone founders who exit entrepreneurship but solely focused on founding teams. Finally, I use the term 'affect' to describe the experience of feeling or emotion. Affect is typically described in terms of positive and negative. I use affect as an umbrella term to encompass both mood and emotion, which are affective states themselves (Watson, Tellegen, Wiese, & Vidya, 1999). While affect and emotion can be conceptualised differently, in some parts of this thesis I use the terms affect and emotion interchangeably if referencing a study used the term 'emotion' rather than 'affect'.

1.2 Theoretical background

Having provided a general introduction, context and motivation for this thesis, I now discuss the theoretical foundation underpinning all studies. Here, I detail core literature and provide a general discussion as to how each of these core theoretical areas intersect. In each article (chapter 3, 4 & 5) I provide a more detailed, tailored literature review delving into the essential theories relevant for each article.

As discussed in section 1.0, the fundamental theories this thesis explores are affect, conflict, and co-founder exits. Yet, these theoretical areas cover an extensive body of work ranging from general management, to organisational behaviour, and applied psychology. To guide this thesis, I delimit the core focus to entrepreneurship. While there are significant overlaps between these fields, my main contributions are to the field of entrepreneurship, with secondary contributions to organisational behaviour. Further, given the research needs identified in section 1.0 my focus for investigation is how these core phenomena (affect, conflict and exits) play out within the social context of founding teams. Figure 1 shows the overlapping nature of affect, conflict, exits and founding teams, with

the centre black dot in the image representing the theoretical starting point of this thesis.
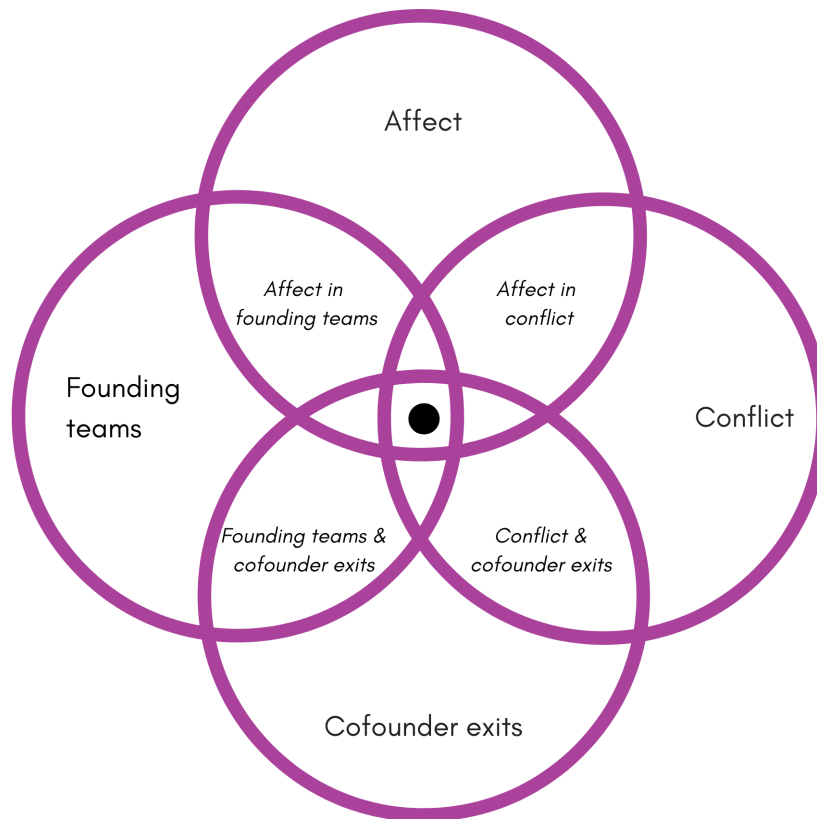
Figure 1: The core theories of affect, conflict, co-founder exits and founding teams that underpin this thesis

1.2.1 Founding teams

In their recent literature review, Knight et al. (2020) suggest that even though scholarly interest in founding teams has grown substantially over the past 40 years, a lack of consensus in the conceptualisation and operationalisation of founding teams has eroded the field's ability to build systematic knowledge. Hence, due to the lack of conceptual clarity about founding teams, our ability to "paint a clear picture of why some start-up teams are more effective than others" has been stifled (Knight et al., 2020, p. 231). As innocuous as the use of multiple terms to describe the same phenomenon appears (e.g. start-up team, Knight et al., 2020; new venture team, Klotz et al., 2014; founding team, Beckman, 2006; entrepreneurial top management team, Ferguson, Cohen, Burton, & Beckman, 2016) the problem becomes evident considering that each term often refers to different samples studied (Knight et al., 2020). For example, start-up team could refer to entrepreneurship students in a classroom simulation (Jung, Vissa, & Pich, 2017), or the top management team of a stable, 20-year-old venture (Colombo & Grilli, 2005). This lack of clear conceptualisation renders the generalisability of findings across different founding team contexts almost impossible. Hence, Knight and colleagues (2020) attempt to build consensus as to what

a founding team is by deducing the dimensions of a founding team, which are: entitativity, the autonomy of decision-making, and ownership of equity (Knight et al., 2020). I adopt Knight et al's. (2020) conceptualisation of a founding team, and bound the sample of each study to teams that have ownership of equity, are autonomous and are perceived as a single entity. While organisational teams, business people and sole founders are worthwhile and important contexts for future research, I delineate the subject of this thesis of new venture teams (figure 2).

	Established business	New venture
Single person	Business person	Lone founder
Team	Organisational team	New venture team

Figure 2: Defining what is and is not a new venture team

1.2.2 Founding teams and co-founder exits

Literature on founding teams and co-founder exits go hand in hand (e.g. Breugst, Patzelt, & Rathgeber, 2015; Le et al, 2017) yet mostly exit literature neglects the founding team experience by focusing on lone founders exiting entrepreneurship (cf. Hessels, Rietveld, Thurik, & Van Der Zwan, 2018; Wennberg, Wiklund, DeTienne, & Cardon, 2010). Due to my focus on founding teams, for articles two and three I focus on a sub-set of entrepreneurial exits: 'entrepreneurial team member exits' (hereafter co-founder exits). Literature on co-founder exits details the process of exiting a founding team (Gregori & Parastuty, 2021), as opposed to a lone entrepreneur ceasing operation of their venture. I discuss co-founder exit literature in more detail in section 1.2.9.

1.2.3 Founding teams and affect

Further, theories about founding teams and affect also intersect (e.g. Emich, 2020; Foo, 2011). Nevertheless, important literature on entrepreneurial affect has also been undertaken at the individual level. For example, researchers have investigated the influence of affective traits on entrepreneur's goals and satisfaction (Delgado-García, Rodríguez-Escudero, & Martín-Cruz, 2012), examined the role of dispositional affect on entrepreneurial entrance (Nikolaev, Shir, & Wiklund, 2018), and the affective dynamics at play throughout business failure for

lone entrepreneurs (Jenkins, 2021). Hence, while some studies have explored affect in the context of founding teams (e.g. Breugst et al., 2015; Breugst & Shepherd, 2017), there is limited empirical work on the topic of affect at the group level within the context of new venture teams (Knight et al., 2020). This is an important oversight as group affect *"is a piece of understanding group dynamics"* (Barsade & Knight, 2015, p. 141). The decision to focus on affect applied in the context of founding teams had important implications for the operationalisation of data collection methods (see section 2.3), and analysis (e.g. article three), as I ensured that the core phenomena of interest were recorded and analysed at both the individual and team level (see section 2.3). I discuss affect more in the coming section.

1.2.4 Affect

Affect—an individual's feelings and emotions—influences significant aspects of the entrepreneurial process (Baron, 2008; Cardon & Shepherd, 2012). This is especially so in founding teams (Baron, 2008), where emotions run high due to frequent uncertainty and change (ibid). Affect is known to influence innovation (Baron & Tang, 2011; Morris et al., 2012), personal persistence (Cardon & Kirk, 2015), and withdrawal intentions (Shepherd et al., 2009). Yet, research has mostly focused on the valence facet of affect (valence is conceptualised on a continuum from positive/pleasant to negative/unpleasant) at the individual level (*see figure four;* Delgado García, De Quevedo Puente, & Blanco Mazagatos, 2015). This hampers our knowledge about the entrepreneurial process, as the majority of ventures are founded by teams (Beckman, 2006), and even in ventures founded by lone entrepreneurs, management is likely to be performed by a team eventually.

Hence, further investigation into the dynamic, ever-changing nature of affect in founding teams is essential to further the development of rich, nuanced theory that can better distinguish the '*why*' between high and low performing founding teams (Klotz et al., 2014).

Additionally, the focus on valence and individuals has left an urgent need to better understand the different dimensions of affect at play within the founding team context. Even though affect is typically conceptualised as either positive or negative (Foo, Uy, & Murnieks, 2015), there are two primary dimensions the underpin affect: activation and valence (Barrett & Russell, 1999). Activation or arousal, the level of energy ranging from low activation to high activation (Foo et al., 2015), and valence are conceptualised as a circumplex model, see figure 3 (Russell, 1980). Activation refers to the energy level with which the affect is expressed (Barsade, 2002). These energy levels are best assessed via dynamic real-time physiological measurements (Nyklicek, Thayer, & van Doornen, 1997), because in response to emotional stimulus, the autonomic nervous system activates a stress response (the fight or flight response), increasing heart rate and activating sweat glands.
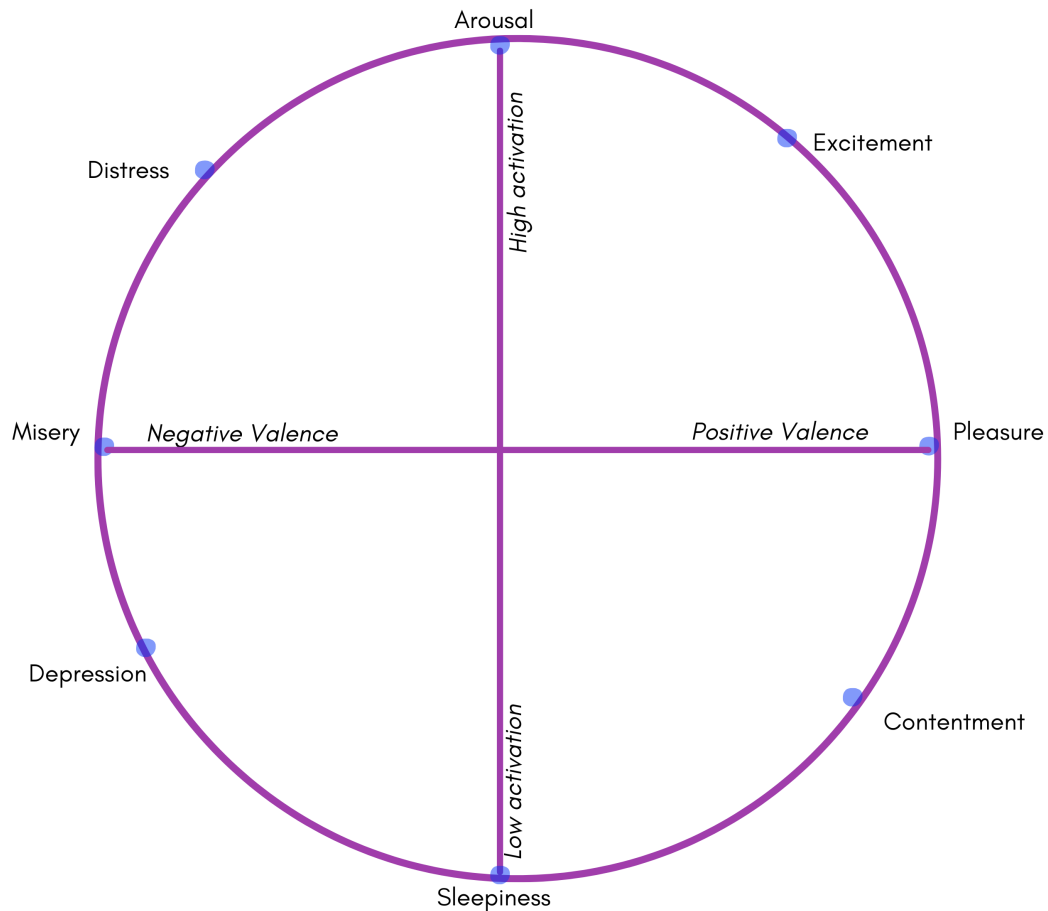
Figure 3: The circumplex model of affect and activation. Affect is on the x-axis, ranging from negative valence to positive valence. Activation on the y-axis, ranging from low activation to high activation. Adapted from Russel, 1989.

Within entrepreneurship literature, scholars have typically fallen into two groups: those that focus on the dynamics surrounding specific types of affect e.g. grief, stress, or passion (Cardon et al., 2009; Shepherd, 2003), or those that focus on broader positive and negative affective experiences (Baron & Tang, 2011; Foo, 2011). Even though affect has two dimensions, those who focus more on the impact of positive and negative affect on elements of entrepreneurship typically do so without measuring, or conceptualising, activation (Baron & Tang, 2011; Baron, Tang, & Hmieleski, 2011). That said, some scholars acknowledge activation, but do not focus on it (e.g. Hayton & Cholakova, 2012). Nevertheless, research has established how important activation is in influencing behaviour (Morris et al., 2012), making it integral to incorporate in entrepreneurial affect research.

A 2015 literature review on entrepreneurial affect revealed that at the time, of 65 studies identified, only one study investigated valence *and* activation in the group context (Delgade Garcia et al., 2015), see figure four. I conducted a literature search from 2015 using Delgade and colleagues search terms to create a more comprehensive picture of literature, of the six studies published from 2015 to
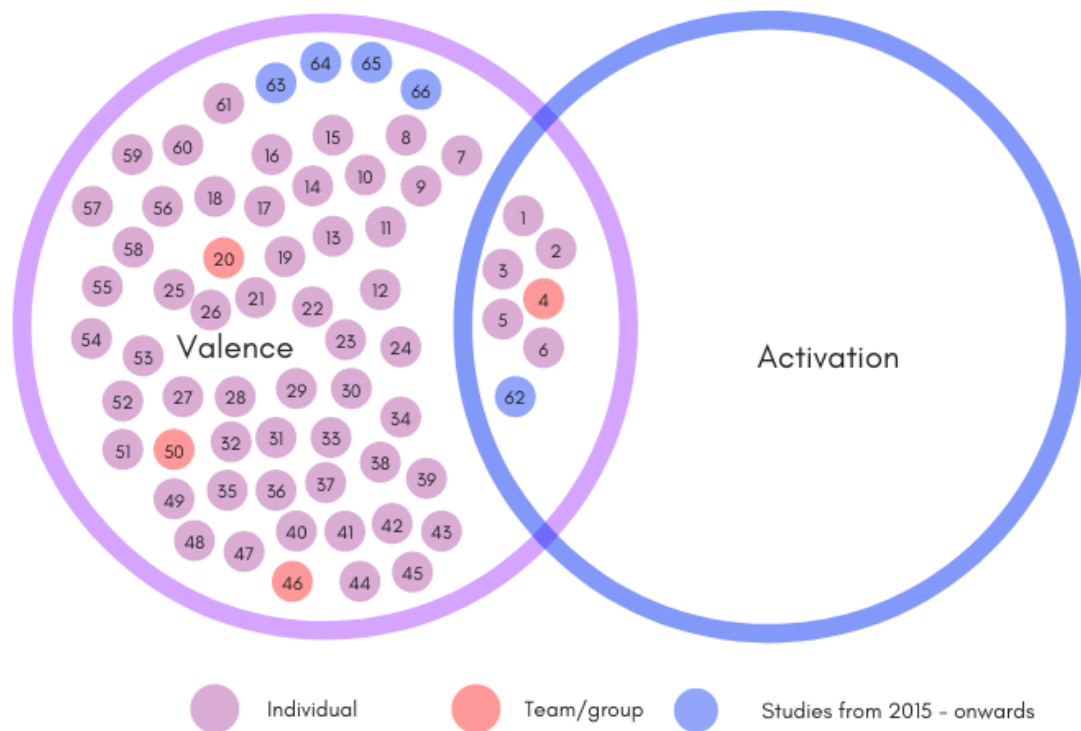
Figure 4: (Adapted from Delgade Garcia et al., 2015). Literature investigating entrepreneurial affect, each number represents a study. Red dots indicate studies conducted at the team level, purple dots indicate studies conducted at the individual level, blue dots indicate studies published after Delgado's literature review, using their search terms[1], all blue dots are at the individual level.

2021 that are found using their search terms, only one investigates both valence and activation, but this is only conducted at the individual level. Understanding both the type of affect, and the level of activation, is essential in understanding how affective dynamics impact founders behaviour in founding teams in the long run. Hence, this urgent research need is addressed in my thesis. This sizeable gap is the starting point, as I aim to investigate how both valence and activation at the team and individual level impact founding teams over time.

1.2.5 Group affect

Group affect, or shared/collective affect (*table 1*), is a collective level affective response that is generated through social interaction (Barsade & Gibson, 2012 p. 119). Shared affect is thus an essential aspect in group dynamics (Barsade & Gibson, 1998; Kelly & Barsade, 2001; Knight & Eisenkraft, 2015). Research finds that fewer negative emotions are experienced by teams that are affectively similar (Kaplan, Laport, & Waller, 2012), compared to teams with high affective diversity. Low levels of shared affect, also called affective diversity, adversely impacts group effectiveness (Barsade & Gibson, 2012). Overall, low levels of

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[1]'entrepreneur*' (to include entrepreneurs], entrepreneurs, entrepreneurial, entrepreneurship) AND 'emotion*' (to include emotion[s], emotional); 'affects'; 'affect*' (to include affective, affectivity); and 'mood*'

shared affect can lead to enhanced conflict and less cooperation (Barsade, Ward, Turner, & Sonnenfeld, 2000). Within the context of founding teams, recent research has found that affective diversity (passion diversity in this case) is negatively related to performance in a study of 107 teams (Mol et al., 2020). Further, teams experience dynamic changes to affect over time, with fluctuating levels of affective convergence and divergence throughout various interactions. Yet interestingly, literature has largely neglected investigation into how dynamic changes in shared affect impact founding teams. This is an important oversight considering we know how various stages of entrepreneurship impact affect, for example when teams experience a co-founder exit (Gorgievski & Stephan, 2016). Hence, using the lens of shared affect is necessary to build new, comprehensive theories about group affect in founding teams.

Group-level affective constructs	Description
Affective diversity/ divergence	Difference affective states across group members, which can emerge at any point and time and result in team members experiencing different emotions
Affective dynamics	The pattern of change over time in group affect, due to processes that cause fluctuation in collective affect
Affective convergence	Affect that is shared by group members

Table 1: Group affect: Collective-level affective constructs adapted from Barsade & Knight, 2018

1.2.6 Conceptualisation of affect in other disciplines

As discussed in section 1.2, the concepts explained in other disciplines are already being disseminated to founders who are seeking information on improving the affective dynamics within their founding team (Perel, 2019). A potential justification for this is due to the significant deviation in affective concepts between entrepreneurship and other disciplines like relationship psychology. For example, while both marital research and team research establish that affective patterns have important consequences for long-term outcomes (Emich, 2020; Gottman & Krokoff, 2005), the study of affective patterns at the team level is relatively underdeveloped in entrepreneurship (Emich, 2020), compared to marriage research. One example of this is the central theory focusing on affective patterns in marriage, called the balance theory of marriage (Gottman & Levenson, 1992). The balance theory of marriage posits that the balance between positive to negative affect is critical in influencing long-term outcomes (Gottman & Levenson, 1992). The affective pattern of more negative than positive affect repeatedly predicts divorce (Gottman & Leveson, 1992; Gottman, Murray, Swanson, Tyson, & Swanson, 2002). Yet, the reliance on the PANAS scale (Watson, Clark, & Tellegen, 1988) of

affect in entrepreneurship literature (e.g. Foo, Uy & Baron, 2009; Baron & Tang, 2011) limits the ability to understand and test the impact of various affective patterns at play over time within founding teams. Whereas in marital research affect is conceptualised as a dynamic, ever-changing phenomenon, in constant flux, and it is measured as such. Given the disparities in how these fields conceptualise affect, and that marital scholars have richer, dynamic conceptualisations of affect, I draw inspiration from other fields in the conceptualisations and operationalisations of affect, employing these dynamic valence and activation methods in entrepreneurship for the first time.

1.2.7 Conflict

Within teams, conflict can have negative consequences for performance (Choi & Cho, 2011; Jiang, Zhang, & Tjosvold, 2012;), or lead to positive outcomes (Passos & Caetano, 2005). On the one hand, the very presence of conflict threatens to distract a team from their core tasks; it threatens the necessary redeployment of team resources from proactive work to reactive work, hence tension and antagonism can distract teams (Hackman & Morris, 1975). Conflict may force a refocusing of energy to remedy a team's differences in opinions and beliefs. Conflict can limit the information processing ability of the group as they focus their energy on each other as opposed to tasks (De Dreu & Weingart, 2003). Yet conversely, research has also shown that the act of refocusing is not always detrimental to a team, sometimes teams will benefit from conflict by improving decision making quality (Amason, 1996).

Specifically, different types of conflict are more or less likely to lead to performance benefits or detriments. Namely, Jehn presents three types of conflict: task, process and relationship (Jehn, 1997). Task and process conflict – which are disagreements over the process of accomplishing a task (Thatcher, Jehn, & Zanutto, 2003) – can create positive benefits (Janssen, Van De Vliert, & Veenstra, 1999; Simons & Peterson, 2000). Whereas relationship conflict often leads to detrimental effects (De Dreu & Van Vianen, 2001). Yet, even though these conceptual distinctions are clear, empirical evidence suggests that the reality is more complicated (De Dreu & Weingart, 2003). De Dreu and colleague's meta-analysis (2003) highlights this inconsistency, showing that regardless of how a team's conflict was categorised (task, process or relationship) the consequences are the same: conflict is always somewhat disruptive. The inconsistencies about the impact of conflict remain within founding team research, for example, task conflict has been found to relate negatively to member-rated team effectiveness in one study (Foo, 2011), while conversely benefiting some founding teams in another study (Breugst & Shepherd, 2017). However, relationship conflict was related to team repulsion and was part of the process of teams drifting apart (Breugst et al., 2015). Taken together, within broader management literature and entrepreneurship literature more specifically there are mixed findings about the impact of conflict on teams and founding teams more specifically. These inconsistencies act as my starting point for article one and article three specifically.

1.2.8   Conflict and affect

One explanation posited to explain the detrimental nature of relationship conflict is that relationship conflict elicits negative affect (Amason, 1996). Scholars describe task and process conflict as functional and separate to emotion (Schweiger & Amason, 1994), void of negative emotions (Jehn & Mannix, 2001) and cognitive in nature (Priem & Price, 1991). However, by using this terminology, we are assuming that affect is not a characteristic of task and process conflict, but rather assuming those types of conflict are solely cognitive. This is contrasted with the conceptualisation of relationship conflict. Relationship conflict is described as something derived from emotional clashes (Guetzkow & Gyr, 1954), based on interpersonal incompatibility (Jehn, 1995), dysfunctional (Amason, 1996a) and highly emotional (Pelled, Eisenhardt, & Xin, 1999). Essentially, scholars have made non-empirically tested assumptions that conflate the topic of team conflict with the *affective characteristics* of the conflict (e.g. that it is either highly emotional or void of negative emotions). I explore the relationship between conflict and affect in article one, and then test the assumed dynamics of affect and conflict which predict co-founder exits in article three. It is important to note that due to the overlapping nature of theories on conflict and affect, these theories form the theoretical basis of my thesis, applied in the context of founding teams to better understand co-founder exits (see article two and three).

1.2.9   Co-founder Exits

Founding teams are not static entities, but rather dynamic, living entities that experience membership changes across various lifecycles stages (Patzelt et al., 2020). One such membership change happens as a result of 'entrepreneurial team member exits' ('co-founder exits' hereafter), a subset of entrepreneurial exit literature (Gregori & Parastuty, 2020). While broader entrepreneurial exit research has typically covered entrepreneurial exit intentions (DeTienne & Cardon, 2012; DeTienne, 2010), the strategies and process of exit (Åstebro & Winter, 2012; Ryan & Power, 2012), and more recently the impact of entrepreneurial exit on an entrepreneur's mental health (Hessels et al., 2018), the majority of the studies focus on the exit of individual entrepreneurs from self-employment (cf. Hessels et al., 2018; Wennberg et al., 2010). This focus on individuals has created important knowledge about entrepreneurial exits more generally, yet a co-founder's exit entails "serious consequences for the exiting individual, the remaining team, and the performance of the affected venture" (Gregori & Parastuty, 2020, p.847). While scholarly attention to co-founder exits has been growing, it is considerably fragmented across entrepreneurship and management literature, yielding contradictory findings: co-founder exits can increase positive consequences (Chandler, Honig, & Wiklund, 2005), or reduce survival rates for ventures (Le et al., 2017). I posit that a driver of these inconsistent results is the lack of attention paid to the affective antecedents at play in the lead up to, and during and after a co-founder exit. Considering we know that exiting entrepreneurship if highly emotional (Shepherd, 2009), the oversight of unpacking the affective dynamics at play in this context is significant. While only one study investigates exits from a team perspective by exploring *how* interaction processes can trigger an exit event

(Breugst et al., 2015), more needs to be done to integrate concepts from wider team process literature to explore the internal, underlying affective mechanisms throughout a team's social interactions that lead to co-founder exit (e.g. Gregori & Parastuty, 2021; Patzelt et al., 2020).

1.3 Research aims and thesis structure

Considering the theoretical background of this thesis, the research gaps I discussed in section 1.2, and the urgent need for research to investigate how the affective dynamics at play in founding team interactions impact the long term outcomes of the venture (Patzelt et al., 2020), the over-arching research question guiding this project is:

How do affective dynamics and conflict within founding team interactions impact cofounder exits in the long run?

RQ1 RQ2 RQ3

Underpinning this overall research question are three fundamental questions that form the basis of each paper. The first question and corresponding article investigate affective dynamics and conflict within founding team interactions. The second question and corresponding article investigate how affective dynamics and conflict within founding team interactions impact co-founder exits. The final research question and corresponding article investigate how affect and conflict impact co-founder exits in the long run.

As such, these three articles build upon each other and are designed to work in complementarity, each employing varying methodologies to investigate the overarching research question from a different angle. Figure 9 in section 2.4 visually shows how these articles progress chronologically, with article one taking a micro process-lens approach to investigate the role of affect in team conflict at one point in time. This article is cross-sectional. There are two core findings of this article. First, unexpectedly, the amount of negative affect emoted was not in line with the amount of relationship or task conflict reported. Specifically, while significant literature suggest relationship or "affective conflict" is the only type of conflict to elicit negative affect, we did not find that. Rather, we find that there was a range of positive and negative affective reactions throughout conflict, hence we introduce a new typology of affective responses in conflict.

Building upon the first study, and in pursuit of investigating the overarching research question, the second study was conducted longitudinally. I followed the same teams that participated in article one. However, rather than including the full sample, I delimited the sample of this second study to only teams that experienced a co-founder exit. In this article, my focus moved from a micro process-lens (one interaction) to a longitudinal process lens (one year of team

interactions). I asked, *'how do varying levels of shared cognition and shared affect in team interactions shape a co-founder's exit? Why do the outcomes of co-founder exits vary between teams?'*. By delimiting the sample only to teams that experienced a co-founder exit, I could avoid the usual empirical comparison between teams that remained intact, and teams that experienced separation; I solely focused on understanding the wide range of affective antecedents and consequences of a co-founder exit. In this article I present a model of affective and cognitive dynamics in the co-founder exit process. Specifically, I show how patterns of high and low shared affect and cognition impact team interaction spirals, which in turn influence the level of team conflict, exit speed and a leaving co-founder's commitment to the venture.

Finally, building upon the findings of both the first and second study, in the third article I set out to investigate all founding teams present in my total sample. Having tracked them over an extended time, I progressed from the theory-building nature of studies one and two and moved closer to the theory testing domain. Namely, the third paper had a quantitative focus with additional qualitative insights. The objective of this paper was to understand if the affective dynamics in founding teams can predict a co-founder exit, as they can in the field of marriage research. In this article, I tested the oft-used marriage metaphor detailed in article three, chapter 5. I found that like article one, counter to expectations relationship conflict did not increase linearly with negative affect, and did not predict a co-founder's exit; whereas task conflict and positive affect were highly predictive. Specifically, we found evidence for a new, important variable: masked positivity. Every co-founder who emoted masked positivity went on to exit their venture in the coming 12 months.

These three articles form the basis of my thesis and are featured in chapters 3, 4 and 5. Chapter 1 provides an overall introduction to my research topic, and conceptual clarity regarding the key, important theoretical perspectives discussed in my thesis. Chapter 2 discusses the methodological approach I took, and justifications for the methodological decisions I made throughout this project. Here, I go into greater detail about the facial expression analysis algorithm I employed and the careful consideration that went into that decision. Following that, I feature the three core articles (chapter 3, 4 & 5). In chapter 6 I bring together and discuss the results and important findings across this body of work as a whole. I outline my main contributions to the three fundamental theories I engaged with across all articles. I conclude the thesis by discussing the overall limitations of this thesis, important directions for future research and overall conclusions.

1.4 Further work

In addition to the three core articles the form the basis for this thesis, I have included two additional appended papers that I wrote throughout my PhD. These papers also research entrepreneurial affect, but deviate from investigating affective interactions to utilizing epidemiological data to research affective disorders (such as depression in new venture teams – appendix paper one; and substance

use disorder in founders – appendix paper two). Versions of these papers have been presented at relevant entrepreneurship conferences (e.g. Academy of Management conference and/or Babson Entrepreneurship Research Conference) and developed throughout paper development workshops (e.g. Journal of Applied Psychology paper development workshop). These two papers have been selected for the Frontiers of Entrepreneurship BCERC Proceedings and will be submitted to target entrepreneurship journals at the beginning of 2022.

Further, in response to the Covid-19 pandemic, while I had to significantly pivot and adjust my data collection strategy, I was able to participate in the entrepreneurial well-being project led by Ute Stephan at Kings Cross, London. In this project, I was the lead investigator for Denmark. I would like to thank the whole authorship team for their effort in that project.

2 | METHODOLOGY

I now detail the methodological approach I adopted to investigate my overall research question. First, I start with the philosophical considerations and assumptions that underpin this project. Second, I discuss how the three studies work together to create knowledge. Third, I discuss the common methodological challenges encountered in measuring affect in teams, and how these challenges informed my methodological choices. Fourth, I note the considerations behind the 'how and why' of the methodological decisions I made, noting how these methodological choices were best suited for this thesis. Finally, I outline the methods I used in detail, discussing how these methods work together in complementarity to answer my overarching research question. A more detailed description of the methodologies specific to each paper is available in each paper (chapter three, four, five).

2.1 Philosophical stance

Here I address the assumptions about the nature of realities I encountered in my research (ontological assumptions), about human knowledge (epistemological assumptions), and my own values in the research process (axiological assumptions); in addressing these assumptions, I was able to create a more credible research philosophy which underpins my methodological choices, data collection approaches and analysis techniques (Saunders, Lewis, & Thornhill, 2019).

Given the explorative nature of my research question I identified the research paradigm of pragmatism as being well suited to guide this project. The philosophy of pragmatism strives to reconcile both objectivism and subjectivism (Saunders et al., 2019). The nature of the phenomena of interest (affect) is both subjective and objective and can be measured quantitatively and qualitatively. Considering this, the research question could be answered by utilising multiple methodologies.

Early on in the research process, it became obvious that working with different types of knowledge and methods would aid in better interpreting the multiple realities present within new venture teams (Keleman & Rumens, 2008). Therefore, I identified the pragmatist philosophy as best suited to this thesis, as I aim to contribute both to theoretical advancement, and to practical solutions that can inform future scholarship and practice.

In line with the pragmatist paradigm, I view reality as both singular and multiple. Singular in a sense that I believe a theory may exist that can explain the phenomenon of interest; and multiple, I also see it as important to assess a range of individual inputs in regards to the phenomenon of interest (Teddlie & Tashakkori, 2009). In line with this philosophy, in this project both subjective and objective

knowledge is valued (Teddlie & Tashakkori, 2009). From an ontological perspective, in line with the pragmatist worldview, I embrace ontological pluralism, I assume multiple theories and perspectives can both exist and be true (Johnson, 2011). Further, the epistemological position I adopted was one that assumes there are numerous ways to create knowledge (Johnson & Gray, 2010), I discuss in detail how I used the three core studies in this thesis to create knowledge in *section* 2.2. Adopting a pragmatist research philosophy enabled me as the primary researcher to adopt a pluralistic stance, enabling the gathering of all types of data that offer insight into the research question (Creswell & Clark, 2017).

This pragmatism philosophical stance was well suited to my thesis project, as it enables the researcher freedom to "*creatively construct new research approaches and designs and sets of working assumptions that can help answer many research questions*" (Johnson & Gray, 2010, p. 89). Given the dynamic, subjective and ever-changing nature of affect and emotions within the team context, adopting a pragmatist world view enabled me to utilise a mixed-methods approach which kept the primary importance on the research question, deploying multiple methods across the project as a whole to inform the problems being researched (Creswell & Clark, 2017). Thus, this pluralistic philosophy enabled me to be able to investigate the latest cutting edge technology in weighing up what works best in capturing real-time affective data. This philosophical stance also enabled me to combine both deductive and inductive thinking throughout the thesis, mixing both qualitative and quantitative data as the project proceeded (Creswell & Clark, 2017).

2.2 Methodology

This thesis aims to utilise three separate, but connected studies to investigate the same phenomena in three different ways; my aim was for the knowledge generated from this thesis to be greater than the sum of its parts. To do this, I utilised the principles of theory-driven research as the foundation for this thesis. Theory-driven research enables abstraction, and knowledge creation, from the specifics of context and subject-in this case entrepreneurship, founding teams and affect (Eisenhardt & Graebner, 2007; Friedman, 2003). Strong theory-driven research creates robust scientific knowledge that is both valuable internally, and accessible eternally (Cash, 2018). Core to theory-driven research is the theory-building/theory testing cycle (*figure 5*). To create knowledge about my phenomena of interest, I followed that theory building/testing spiral (Cash, 2018). Each of my papers builds on the previous to create a cohesive development of scientific knowledge.

My entry point for this thesis was in the theory-building stage of the '*definition of variables*' (Cash, 2018; see *figure 5*). My first study, which was in the theory-building mode, aimed to identify key variables, map interconnections between concepts and identify salient themes and processes. It was guided by the research question: *What are the key concepts in the conflict process in founding teams? How are conflict types, positive, negative and neutral affect related to team conflict?* The first study (*article one*) is a process-oriented, multiple case study (Yin, 2018).

I used a mixed-method approach by collecting qualitative and quantitative data (*see section 2.3*). This first study explores and defines (i) task, process and relationship conflict (Jehn, 1997), (ii) positive, negative and neutral affect, and (iii) affective dynamics throughout team interactions. Hence, this first study precedes the latter two studies by defining and exploring the variables of interest that are built up in study two (*article two*) and study three (*article three*).

The second study (*article two*) was designed to build upon the definitions and patterns described in study one. In this study, I moved further into the theory building mode and focused on the 'relationship building' stage of theory building (Cash, 2018). This study focused on the variables defined in study one—conflict and affect—yet moved on from defining these variables within the context of founding teams to exploring connections between variables and the underpinning mechanisms that explain the '*how*' and '*why*' of co-founder exits. This study used qualitative case studies, dynamic affective data and follow-up interviews from nine founding teams over twenty months. I examined how differences in affect and conflict go on to impact membership changes in founding teams. The multiple case study approach grounded our theorising in data to inductively establish what is important (Edmondson & Mcmanus, 2007), and to study the specific relationship between variables (Cash, 2018). It also enabled a highly iterative research approach that is tightly linked to data and appropriate in unexplored research areas (Eisenhardt, 1989).

The third study (*article three*) moved further around the knowledge creation framework into the arena of theory testing (Cash, 2018). In this final study, I built upon the defined variables from study one, and the relationships identified in study two, to test the theoretical model that had emerged from prior research. Specifically, in this final study, I tested the hypotheses about the impact of conflict and negative affect on co-founder exits. This study was designed in complementarity to study one and two as it utilised all the data collected in the prior two studies (affective data, follow-up interviews, quantitative focus, qualitative insights). In study three I followed 29 teams longitudinally and tested the variables of interest previously identified.

Taken together, the three core studies in my thesis (*article one, two and three*) build on each other, investigating how conflict and affect play out to impact founding teams and co-founder exits. I investigate this topic utilising a range of data and methodologies. My entry point in the theory-building/testing cycle spiral was in the 'define' stage of theory building, and my exit point was in the 'prediction and testing' stage of theory testing (Cash, 2018). My ambition is for this thesis to be viewed as a whole, and for insight to be garnered from the three studies collectively. Together, these studies explore the affective dynamics in founding teams in a new way and extend existing theories on entrepreneurial affect and co-founder exits. As such, this thesis contributes to scientific knowledge in the field of entrepreneurship (and adjacent fields i.e. organisational behaviour) by building and testing novel theories about founding teams.
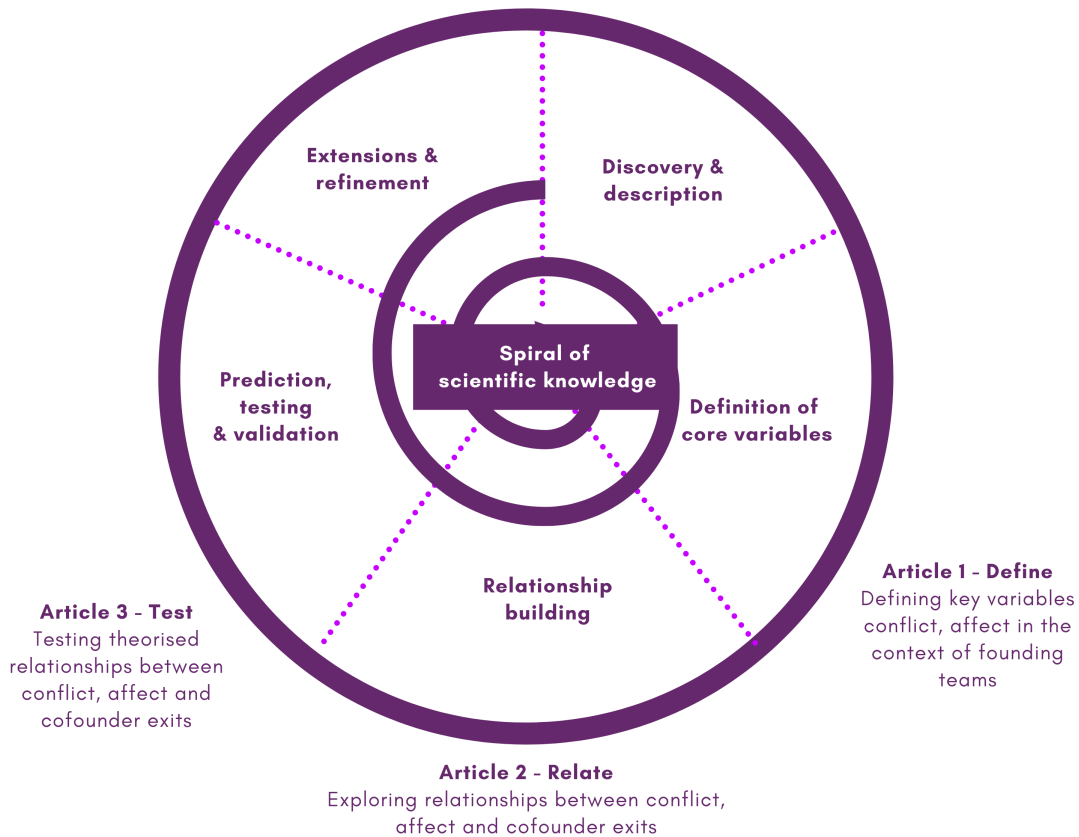
Figure 5: Positioning my studies on the theory building/testing cycle spiral. Adapted from Cash, 2018.

2.3 Measuring affect, activation and cognition in new venture teams

Scholars have begun to identify the emergence of an "affective revolution" (Barsade, Brief, & Spataro, 2003) in the early 2000s, finding that entrepreneurship is a particularly emotional journey (Baron, 2008). While it was noted that there was a *"profound methodological revolution in the study of affect in psychology"* (Barsade et al., 2003, p. 5), the deployment of methodologies sensitive enough to measure the subconscious affective processes has been slower to develop within entrepreneurship research (Cardon et al., 2012). Hence, I spent the early stages of this project researching the most sensitive, appropriate and cutting-edge methodologies used across any discipline to measure activated affect, activation and team dynamics.

There are two main considerations when measuring affect in team interactions. First, there is an over reliance on self-report methods in affect research, for example solely asking participants how they feel as they do not always know. Instead of directly measuring affective and physiological fluctuations in participants throughout team interactions, scholars have relied on static, retrospective affective measurements, like the frequently used Positive and Negative Affect Scale (PANAS) (Watson et al., 1988). This is problematic for two reasons. One, scales do not capture the physiological measurements which are essential in obtaining

real-time metrics of activation in the body. Without capturing physiological measures, it is not possible to measure objective activation, e.g. the intensity of the affect (Barsade, Coutifaris, & Pillemer, 2018). Two, emotions and emotional regulation are not cognitive processes (Koole, 2009). Emotions occur unconsciously, separate from cognition, thus by asking teams to evaluate their emotions and affect, we only focus on the cognitive responses in team interactions. Considering some respondents may lack the self-awareness to understand their own emotions and the emotions exhibited by others, this can lead to systemically biased data. Hence, non-survey based creative approaches are needed (Cardon et al., 2012)

Hence, given these two main challenges, I was inspired to deviate from traditional methodologies due to recent calls for methodological innovation to advance team and entrepreneurship research (Cardon et al., 2012; Cronin Bezrukova, 2019; Delice et al., 2019). While seminal affect scholars noted, "We expect [that] new techniques of measuring and detecting emotions will be advanced" (Barsade et al., 2003, p. 6), more recently these scholars identified video coding of facial expression and non-verbal behaviours as a new "effective and reliable way to read emotions between members within a group" (Barsade et al., 2018, p. 4). Hence, video coding of facial expressions emerged as a way to measure affective dynamics within team interactions. This was done in Chen, Yao, and Kotha's (2009) study of entrepreneurs' passion manifested in facial expressions and body language.

I established criteria that my methodological approach needed to fulfil: (I) it must move beyond self-report measures of affect to objectively measure affect in team interactions (e.g. Warnick et al., 2021) (II) it must move beyond a static, one-point-in-time measurement, and captured real-time fluctuations throughout interactions (Todorova et al., 2014) and (III) it must capture both facial expressions and physiological measures (Gottman & Levenson, 1985). Hence, inspired by Jung and colleagues (2012) earlier work which utilises manual coding of facial expressions in small team research, as well as seminal relationship psychology research which utilises affective and physiological measurements to predict divorce in married couples, I decided to adopt Barsade et al's., (2018) recommendation to utilise video-coding of affective interactions as an essential tool in my methodological toolkit.

Furthermore, to meet my methodological criteria, I adopted Gottman and Levenson's (1983; 1985; 2000) methodological approach which incorporated both physiological data and video coding data through participant observation sessions, which I will discuss further in section 2.4.1.

Hence, given the challenges and rationale for why I selected this methodological approach, I now detail how I operationalised the measurement of facial expressions, physiological activation, and other cognitive measures.

2.4 Quantitative measures of affect and activation

2.4.1 Measurement of affective valence and emotions from facial expressions

Ekman and Friesen (1976) developed the Facial Action Coding System (FACS) to categorise facial expressions based on the position of facial muscles during facial expressions (called action units, figure 6), hence FACS enables researcher's to objectively measure expressions of emotions (Ekman & Rosenberg, 2005). While FACS has been instrumental in the development of an objective rating system for emotions and affect, the analysis is performed by trained coders on a frame-by-frame basis. Therefore coding systems utilising FACS can often result in a lengthy coding process of approximately eight hours per participant per three minutes of footage (e.g. in Jung, 2011). Given the time-consuming nature of this coding, the process is subject to bias due to both coder fatigue, and the affective state of the coder (Warnick et al., 2021).

Fortunately, the machine learning and AI algorithms that utilise computer vision to perform sophisticated facial expression analysis have rapidly progressed to the point where they are now effective methodological tools to be deployed in management research (e.g. see a recent publication in the Journal of Business Venturing by Warnick, Davis, Allison, & Anglin, 2021). Hence, instead of coding affective data by hand, which is prone to human error, I decided to utilise the Affectiva AFFDEX algorithm, operationalised through the Imotions research software (Imotions, 2019).

The Affectiva algorithm is a human perception AI which utilises deep learning, an area of machine learning. It allows AI to model complex facial expressions with higher accuracy than other machine learning techniques (Affectiva, 2020). The Affectiva algorithm was developed based on the FACS framework, and the algorithm was trained on diverse "real-world data sets, made up of more than 4 billion frames, captured from 7.5 million faces in 87 countries" (Affectiva, 2020). The algorithm has been used across a wide range of fields to measure affect and biometric responses to stimuli (Kulke, Feyerabend, & Schacht, 2020).
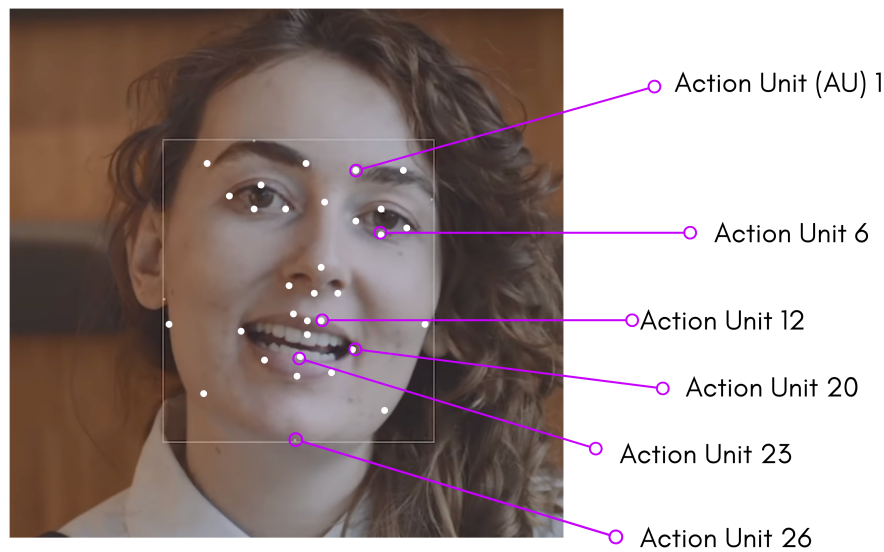
AU	Description	Facial Muscle
1	Inner Brow Raiser	Frontalis, pars medialis
6	Cheek Raiser	Orbicularis oculi, pars orbtialis
12	Lip Corner Puller	Zygomatic Major
20	Lip Stretcher	Risorius
23	Lip Tightener	Orbicularis oris
26	Jaw Drop	Masetter; Temporal and Internal Pterygoid

Figure 6: \Facial Action Units (AU: adapted from the Facial Action Coding System; Ekman et al., 2002). Note: The measurement of each basic emotion is comprised of the following AUs: happiness (AU6 + AU12), anger (AU4 + AU5 + AU7 + AU23), fear (AU1 + AU2 + AU4)

I utilised the facial expression analysis within the iMotions research platform (Denmark, 2019) across all the studies in this thesis. This platform enabled the collection and processing of real-time video data simultaneously, performing facial expression analysis and analysing physiological data. This enabled me to compare and contrast individuals in a team, and their affective response over time, understanding how they differed over time throughout their team interactions. As the algorithm is based on FACS (Affectiva, 2020), the intensity of the emotion is also calculated hence I could ascertain both the valence, specific emotions, and the intensity of emotion. This was synchronised with a recording of galvanic skin response which showed a compelling picture of how strongly an individual felt, and what those emotions consisted of (Affectiva, 2020).

Hence, by implementing this algorithm as a methodology in my data collection, I was able to objectively measure an individual's affect throughout their team interactions. Hence, I collected data that moved beyond a static measurement. Figure 7 shows an example of the timeline created in iMotions, displaying the affective and emotional data across a timeline using my face as an example.
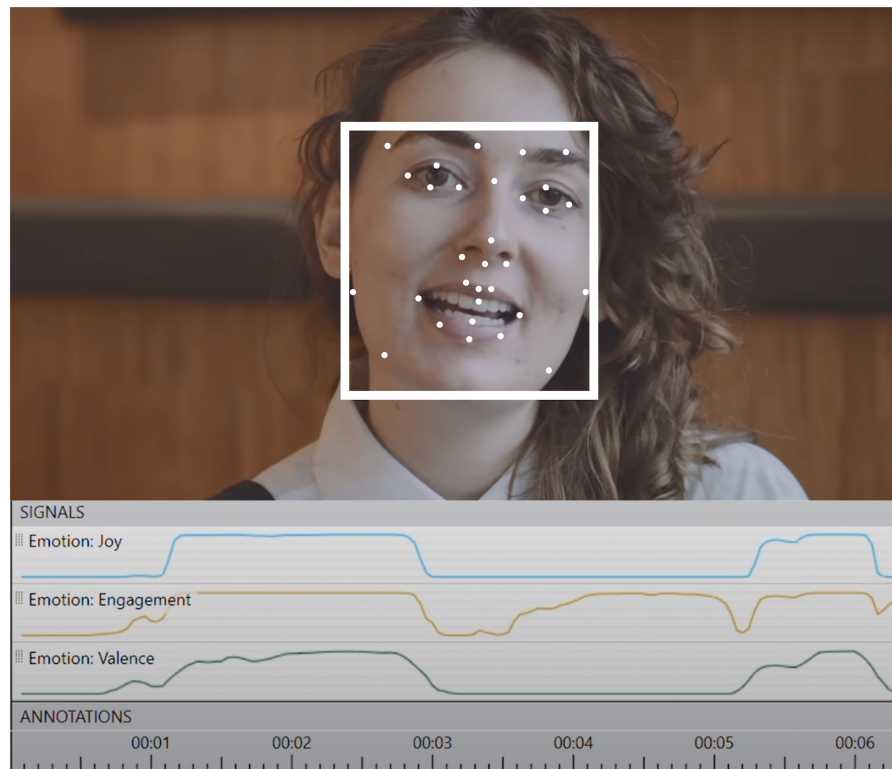
Figure 7: Example of Imotions Affectiva Algorithm analysing valence across an interaction.

2.4.2 Physiological measurements

As I detailed in the literature framework section (section 1.2), a fundamental element of researching affective dynamics is not only capturing data about the presence of positive and negative affect, but also capturing the level of emotional intensity throughout different affective states. This level of emotional intensity, called activation, is best captured through measurements of the sweat glands (Balters & Steinert, 2017). Specifically, the human sweat glands are controlled by the '*sympathetic nervous system*' (Ekman, Wallace, & Friesen, 2013). When the '*flight-or-fight* mode is activated the sympathetic nervous system increases sweat gland activity subconsciously. Hence, when an individual is triggered by an emotional reaction, a physiological reaction occurs (Balters & Steinert, 2017). The bigger the emotional response, the bigger the reaction. The GSR sensors provide an important source of data. In response to a threatening stimulus (such as conflict, anger, frustration or stress) one's autonomic nervous system activates the sweat glands. The greater the emotional arousal, the more moisture is produced this change is measured by GSR sensors (Balters & Steinert, 2017).

Of note, when capturing affective valence data on its own, you do not ascertain the level of intensity. Additionally, whilst capturing the intensity data on its own, you do not ascertain what type of affect is felt. Hence, it is only by capturing both continuous affective data and continuous physiological data that it is possible to objectively understand both what type of affect was present, and to

what intensity.

Hence, this project employed 'galvanic skin response' (GSR) physiological measurements to capture activation levels. Best practice was followed throughout data collection. Namely, to emulate the most naturalistic setting I selected physiological sensors that least constrained the participants. Thus, I used a Shimmer3 GSR+ Unit sensor with a sampling rate of 128 Hz to measure galvanic skin response in micro siemens (µS). Two electrodes were positioned to the palmar surface of the second and third finder of the non-dominant hand (*figure 8*) (Schumm et al., 2008).

Figure 8: Shimmer3 GSR+ Unit sensor positioned to the palmar surface of the second and third finger

2.4.3 Data collection in studies 1, 2 and 3

Given the theoretical framing of my thesis, I drew inspiration from best practices in measuring affect and activation in couple interactions to inform my data collection approach (Gottman & Levenson, 1985; Gottman & Levenson, 1999; Levenson, Carstensen, & Gottman, 1994;). Hence, my data collection approach followed these steps (*figure 9*). First, I conducted a full team observation session. This lasted between 90 – 120 minutes. The complete new venture team attended. Second, I tracked the teams for the coming 12 – 24 months. Unfortunately, due to public health guidelines that were introduced at the time of data collection which prohibited in-person meetings, data was collected over 12 months as opposed to the initial goal of three months. Hence, while we initially intended to follow all teams for 24 months, due to changes in the length of data collection, it was only possible to follow some teams for 12 months. Hence, the follow-up time frame in paper three (*figure 9*) was limited to 12 months to create equal comparison between teams.

2.4.4 Full team observation session

The procedure for the full team interaction was adapted from the work of Gottman and Levenson (Gottman et al., 1998; Gottman & Levenson, 1999; Levenson & Gottman, 1983;). First, we instructed all founding team members to attend the session together. Second, when the teams arrived, I explained the procedure and collected consent. Third, I instructed teams to try to ignore the camera and apparatus in the meeting room and to try and interact naturally. Fourth, I attached the physiological sensors to all members of the team, detailing the purpose of the device. Fifth, I read instructions for the first task in the interaction session (Levenson & Gottman, 1983). Adapted from Gottman and Levenson's 'events of the day' activity (1983), the teams were asked to engage in a typical conversation for ten minutes about how well their start-up is performing and their milestones for the next six months. Video recording and physiological recordings commenced. Sixth, the teams were instructed to complete a 'problem inventory' (Levenson & Gottman, 1983), in which they read a list of common problems in new venture teams, and subsequently created a list of their problems rating them in order of most important. Seventh, I asked each participant to read their list aloud. The teams then selected the three most important issues. Next, the teams were instructed to discuss each problem area in an attempt to reach a solution or compromise for fifteen minutes (Levenson & Gottman, 1983). Eight, I left the room and the problem discussion commenced. Video and physiological data were collected. Finally, I re-entered the room and facilitated resolving and tension from the previous interaction. I removed the physiological sensors and the teams had a ten-minute break.

Following the ten-minute break, for the 18 teams in paper one, I obtained a continuous subjective measure for moment-to-moment changes in affective phenomena during new venture team interactions, I adapted Gottman & Levenson's (1985) rating dial procedure. The participant's scores were recorded through a joystick connected to the Continuous Affect Rating and Media Annotation software 'CARMA' (Girard & Aidan, 2018), which was designed in consideration of Gottman and Levenson's need for continuous measurement of subjective affect. The *Logitech Extreme 3D Pro* joystick was modified (a spring was removed) to stop the joystick from returning to the middle position which would register as a five on the scale (Jung, 2011). CARMA sampled the position of the joystick ten times per second and saved a second by second mean (1 – '*very negative*', 5 – '*neutral*', 10 – '*very positive*'). The final 12 teams that participated in this research project were part of an accelerator that detailed the teams would only be able to spend 90 minutes maximum in the interaction session, hence this exercise was dropped to reduce the time of the session.

DATA SOURCE   **PAPER**

1 **Full Team Observation Session Data**

- Affective Data
- Physiological Data
- Qualitative Task Data
- Quantitative Data
  - Personality
  - Conflict
  - Cohesions
  - Venture performance
- Field Notes

1 **Paper One: Affective Dynamics in Conflict**

- Cross-sectional
- Split sample (18 teams)
- Multiple Case Study
- Process Oriented
- Mixed-method:
  - Affective data
  - Valence/activation data
  - Conflict data

Utilising data source 1

2 **Venture Follow-Up 6 Months & 1 year**

- Venture performance
- Cofounder status
- LinkedIn & Proff.dk venture data
- Research notes

2 **Paper Two: Affect and Cognition in Exits**

- Additional follow-up interviews, semi-structured
- Split sample, 9 teams
- Longitudinal
- Multiple Case Study
- Qualitative focus
- Quantitative insights

Utilising data source 1 + 2

3 **Venture Follow-Up 1.5 Years & 2 Years**

- Venture performance
- Cofounder status
- LinkedIn & Proff.dk venture data
- Research notes

3 **Paper Three: Affect and Founder "Divorce"**

- Additional follow-up interviews, semi-structured
- Full sample (29 teams)
- Longitudinal
- Quantitative focus
- Qualitative insights

Utilising data source 1 + 2 + 3

Figure 9: Data sources and approaches for each study

The final step of the interaction session was for each participant to complete a short survey. In addition to demographic questions (age, education, time in venture, gender), I also collected data on conflict level, team cohesion, personality and team performance. To obtain ratings for conflict levels we utilised Jehn's (1995) conflict scale. For team cohesion, we utilised Bollen & Hoyle's perceived cohesion scale (1990). We utilised a short-form personality scale (Soto & John,

2017). For team performance, we asked every participant "*On a scale of one to ten, how would you rate the performance of your new venture team? One = performing significantly worse than expected, five = performing as expected, ten = performing significantly better than expected*".

2.4.5   Venture follow-up interviews

Every six months following the interaction session, I would contact all the new venture teams and ask a series of questions. These questions were about the perceptions of their performance. E.g. if they had received funding since our previous interaction, if they had grown in headcount, if a member of the new venture team had left, the number of sales in the last six months, and an approximate level of turnover. I contacted the teams first by email, then through LinkedIn, then via mobile phone. I recorded all conversations and transcribed them, as well as research notes and stored all data in detailed case files. In the case of paper two, as the sample was delimited to teams that had experienced a co-founder exit, after the follow-up I interviewed the co-founders who left, and those who remained. In the case of paper three, after finding surprising results, I performed post hoc follow up interviews with relevant teams to understand the mechanisms at play within these teams. All data were recorded, transcribed and stored in case files.

2.4.6   Sample and research context

The goal of this project was to study the affective dynamics in new venture teams; teams that are unstructured, uncertain and can have liminal membership in their early stages of venture emergence. Throughout this emergence, new ventures can be difficult to identify (Ruef, Aldrich, & Carter, 2004), hence making research on emerging and early-stage new venture teams challenging. Due to this challenge, I selected a research setting that would enable the identification and tracking of new ventures over time. Hence, the Technical University of Denmark outside of Copenhagen became the research setting for this project. Due to the extensive start-up ecosystem at the Technical University of Denmark that includes incubators, accelerators and a science park. I first contacted 100 teams at the science park by email and then phone to invite them to participate in this research project. To be eligible for participation, the venture had to be started by more than one person, within the last five years, and be able to meet with all co-founders in person. These three criteria immediately ruled out the vast majority of ventures in the science park due to the number of lone founders and age of the venture, however, five teams from the science park met the criteria and participated. Hence, I decided that the accelerators would be more suitable research as they would enable me to identify ventures in their earlier stage. Hence, I contacted the project managers for the accelerators run at or in partnership with the Technical University of Denmark. In the months that followed, I invited the 40 teams that were part of accelerators and incubators to participate in my research. Of these teams, 24 teams agreed to participate. Incubators and accelerators are a promising context to study new venture teams (Amezcua, Grimes, Bradley, & Wiklund, 2013). Namely, environments like these support the ability to collect longitudinal data on teams and provide access to multiple sources of data.

3 | PAPER ONE

It's Not What You Say but How You Say It: Exploring How Affective Dynamics Impact Team Conflict

Abstract

Scholars assume that the presence of negative affect in conflict depends on the conflict type, namely that it is present in relationship conflict but absent in task and process conflict. We draw on theories of affect from social psychology to investigate the process, presence, and consequences of continuous affective dynamics during team conflict episodes. We utilize physiological and affective measurements to distinguish among activated positive, neutral, and negative affect during relationship, task, and process conflict. Using 18 in-depth case studies with real organizational teams, we find that contrary to assumptions, negative affect was expressed in every conflict episode regardless of conflict type and that it did not increase in line with the amount of relationship conflict reported. We also find that positive affect was present—to some extent—in all conflict episodes, regardless of the conflict type. Subsequently, we develop the activated affect and conflict process model and introduce a new typology of the affective responses in conflict. Our findings extend the seminal task, process, relationship conflict typology to show that not only is the conflict type important, but so too is an individual's conflict style throughout team conflict episodes.

Keywords: Affect; Conflict Type; Team Processes; Physiological Activation; Facial Expression Analysis

3.0 INTRODUCTION

Teamwork is vital to successful organizations (Delice, Rousseau, & Feitosa, 2019), yet when working in teams, intragroup conflict is unavoidable (Simons & Peterson, 2000). Prior literature in Organizational Behaviour (OB) has found that intragroup conflict is a double-edged sword – it can be associated with effective decisions (Janssen, Van De Vliert, & Veenstra, 1999; Jehn, 1995; Simons & Peterson, 2000), or it can threaten personal relationships and derail team performance (Choi & Cho, 2011; Jiang, Zhang, & Tjosvold, 2012).

Early scholars posited that not all types of conflict are detrimental to group functioning (e.g. Amason, 1996; Van de Vliert & De Dreu, 1994). Namely, relationship conflict was assumed to hinder performance due to being 'highly emotional' (Pelled, Eisenhardt, & Xin, 1999), whereas task and process conflict was assumed to be beneficial to team effectiveness (Amason, 1996), as they are 'separate to emotion' (Schweiger & Amason, 1994) and "void of intense interpersonal negative emotions" (Jehn & Mannix, 2001, p. 4). However, this early lens has been called into question by meta-analyses, which reveal strong, negative correlations between task conflict, team performance, and team member satisfaction (De Dreu & Weingart, 2003), as well as strong, negative correlations between process conflict and group outcomes (De Wit, Greer, & Jehn, 2012).

In response to this mismatch of empirical and theoretical understanding, recent research has started to view negative affect and conflict type as theoretically and empirically distinct. For example, negative affect is now thought to be a pivotal mediator between conflict and performance (Greer & Jehn, 2007). Yet, despite theorizing about the role of negative affect (Jiang et al., 2012), there is a lack of theoretical justification as to why negative affect, as opposed to positive or neutral affect is key (Todorova, Bear, & Weingart, 2014). Further, while a number of recent studies do explicitly measure negative affect (e.g. Greer & Jehn, 2007; Jiang et al., 2012; Kerwin & Doherty, 2012), and very few measure positive affect (e.g. Todorova et al., 2014; Mauersberger, Hess, & Hoppe, 2020), all of these use self-report surveys to capture a static, retrospective affective measurement. This is problematic for two main reasons. First, this neglects team member's activation levels, e.g. the level of arousal experienced when feeling emotions (Todorova et al., 2014), which has recently been shown to be an important variable in conflict (e.g. Mauersberger et al., 2020). Second, both affect and activation fluctuate dynamically during conflict, which cannot be captured via static, retrospective measures (Cronin & Bezrukova, 2019). This leaves critical empirical and theoretical gaps surrounding the nature of, and relationships between, core conflict concepts. Specifically, there is a need to investigate if positive or neutral affect are present across conflict types, if affect remains constant or fluctuates during conflict episodes, and how activation levels change between moments of positive and negative affect.

Given this theoretical need, we aim to investigate the process, presence, and

consequence of activation and affective dynamics during conflict episodes. To do this, we draw on established social psychology theories including the affective balance theory of marriage (Gottman & Levenson, 1992), the affective ratio of divorce (Gottman & Levenson, 2000), and activation patterns in conflict (Gottman & Levenson, 1992). Further, in order to empirically interrogate these affective dynamics, it is necessary to move beyond the use of static, retrospective scales to real-time, continuous measurement. Thus, we analyse 18 explorative case studies, where we capture continuous physiological data, facial expression data, and dynamic affective rating data throughout an entire conflict episode.

Based on our findings, we make three core contributions. First, we provide evidence to show that conflict type and affect are two empirically and theoretically distinct variables. Specifically, not all relationship conflict features negative affect, and not all task or process conflict is void of negative affect, but rather positive, negative, and neutral affect fluctuate continuously across all conflict types. Second, we introduce the *activated affect and conflict process model,* which extends Jehn's (1995, 1997) seminal conflict typology by highlighting a three-dimensional view of the conflict process: conflict type, affect, and activation in relation to conflict intensity and conflict process progression. We introduce activation as an important variable in conflict, and evidence how affect and activation are intertwined during conflict episodes. Finally, we introduce the *typology of affective conflict styles* to provide evidence of how different activated affective responses can shape the conflict episode, either by increasing or decreasing the conflict intensity, and shaping the progression of different conflict processes, including conflict resolution, *conflict redirection, and conflict spiralling.*

3.1 THEORETICAL DEVELOPMENT

In order to address the theoretical need, we develop a conceptual framework that supports the investigation of the four major assumptions about affect, activation, and conflict: (i) that relationship conflict—as opposed to task and process conflict— will feature high levels of negative affect (Amason, 1996); (ii) most conflict episodes will not feature significant positive affect (Greer & Jehn, 2007); (iii) activation may be an important variable throughout conflict episodes (Todorova et al., 2014); (iv) static, retrospective conflict measures can adequately capture the conflict process (e.g. measures in Jiang et al., 2012). Thus, we consider conflict type, affect, and activation in a process context to examine their fluctuation and impact over time. Seminal OB conflict research focuses primarily on conflict type, i.e. the focus of conflict in terms of relationship, task, or process (Jehn, 1995; 1997). This has been extended by recent work to include negative affect as an important moderating variable (Greer & Jehn, 2007). However, this addition raises three main questions when contrasted with research on conflict and affect in the social psychology literature (Gottman, 1993).

First, affect dynamically varies between positive, neutral, and negative (Gottman, Driver, & Tabares, 2015), which typically elicit substantially different responses

within a conflict episode (Gottman & Levenson, 2000). Critically, this calls into question the current focus on negative affect alone, especially considering affect researchers have shown that the presence of negative affect does not mean the absence of positive affect (Watson, Tellegen, Wiese, & Vidya, 1999). Second, developments in social psychology highlight temporality as key to understanding conflict type and associated affective characteristics (Gottman & Levenson, 2002). Here, outcomes, such as conflict intensity and progression of the conflict process (Gottman et al., 2015), are impacted not just by the overall average or final affective state but by the affective dynamics across the whole conflict episode (Gottman & Levenson, 1992). Therefore, in order to predict the impact of conflict on dyads and small groups, there is a need to understand the process of continuous fluctuation in affect throughout conflict episodes, as opposed to a static, retrospective affective measurement (Jung & Leifer, 2011). This conceptualization treats conflict type and the full range of positive, neutral, and negative affect as two distinct variables (Jung, 2016).

Third, emotions occur unconsciously, and throughout interactions. These emotional states are expressed unconsciously, for example, via micro facial expressions (Barsade, 2002). This means that in order to measure the dynamic and unconscious expression of affect, it is necessary to employ real time measurements such as facial expression data, and dynamic affective rating (Kim et al., 2012; Warnick, Davis, Allison, & Anglin, 2021); going beyond prior self-report approaches (e.g. Todorova et al., 2014).

Finally, existing research highlights the deleterious impact of 'active' negative affect like anger, irritation, and frustration during conflict (Jehn & Mannix, 2001). These emotions have a high level of activation compared to passive negative affect like sadness (Todorova et al., 2014). Activation refers to the energy level with which the affect is expressed (Barsade, 2002). Again, energy levels are best assessed via dynamic real-time physiological measurements (Nyklicek, Thayer, & van Doornen, 1997), because in response to emotional stimulus, the autonomic nervous system activates a stress response (the fight or flight response), increasing heart rate and activating sweat glands.

3.1.1 Proposed Integrative Frame: Initial Conceptual Framework

Our proposed integrative conceptual framework thus explores the unconscious affective and physiological aspects of conflict, bypassing cognition. By measuring conflict type, affect, and activation levels directly and continuously, we can evaluate an individual's affective responses during conflict. Further, taking these responses as a foundation, we examine how they impact subsequent conflict intensity and conflict process progression. Hence, it is possible to examine each of the major assumptions outlined at the start of this section via a process-based conceptual framework including conflict type, affect, and activation, in relation to conflict intensity and process progression. For example, rather than categorizing dyads by conflict type (task, process, relationship) as in prior works (Jehn, 1995;

1997), our framework also allows the critical fluctuation of activated positive and negative affect during a conflict episode to be taken into account (Gottman, 1993). This provides the basis for our guiding Research Question (RQ): *What is the process of conflict in organizational teams, and how are conflict type, activated positive, negative, and neutral affect related in organizational team conflict?*

3.2 METHODOLOGY
Research Design

Given the RQ and the need for an explorative study to understand the relationship between conflict type, affect, and activation, we conducted a series of process-oriented studies of team conflict episodes. This combines the logic of the classical explorative multi-case study approach (Eisenhardt, 1991; Langley & Truax, 1994) with fine grained, real-time process measurement of affect and activation (Nyklicek et al., 1997). Here, the process measurements provide the core data, while the multi-case study approach provides the logic for iteratively exploring and abstracting thematic understanding regarding key variables and relationships (Eisenhardt, 1989). The process-oriented analysis deals with dynamic changes and process features over time (Isabella, 1990; Langley, 1999), which are then verified via iterative comparison across the various observed teams (Eisenhardt, 1989b). This also aligns with recent calls for temporal and process sensitive methodological innovations to advance team research (c.f. Cronin & Bezrukova, 2019; Delice, Rousseau, & Feitosa, 2019). Thus, our approach enables the robust incorporation and analysis of a variety of qualitative and quantitative information.

Given the overall need for theory building in this area, and the primarily qualitative approach, we aim for robustness in relation to analytical generalisability (Eisenhardt & Graebner, 2007; Robson & McCartan, 2011). To this end, we emphasised gathering in-depth data on the phenomena of interest and abstraction through theoretical analysis (Yin, 2018). This builds on the use of multiple in-depth observations and measurements in order to triangulate findings and refine insights (Eisenhardt & Graebner, 2007; Yin, 2018). We ensured two main methodological criteria were met: that each observed team provided access to rich data and in-depth analysis and that these teams were representative of real-world teams in their own context (Yin, 2018).

3.2.1 Sample

A purposive 'typical case' sampling approach was used (Onwuegbuzie & Collins, 2007). Here, we identified real-world, professional teams reflecting the 'typical' context of organizational teams that make high stakes decisions, where uncertainty and pressure are rife. To create a naturalistic environment, we selected upper echelon teams in the context of new ventures. This is defined as *"the group of individuals that is chiefly responsible for the strategic decision making and ongoing operations of a new venture"* (Klotz, Hmieleski, Bradley, & Busenitz, 2014, p. 227).

As new ventures are characterised by high personal investment, uncertainty, and high affect (Klotz et al., 2014), these teams have real responsibility for decision making, and their conflict is consequential (Onwuegbuzie & Collins, 2007).

We approached 120 businesses at science parks and accelerators in Denmark. We explained our project, namely, that we are researching communication and conflict resolution in teams and that participation would include our observation of their team having naturalistic conversations. We selected 18 teams for observation, which represented a range of sizes (min. 2, max. 6, mean 3), member age (min. 20, max. 54, mean 26), type of business (high and low growth orientation), and industries (high tech, low tech). We balanced the requirements of saturation, triangulation, and in-depth insight (Yin, 2018).

3.2.3 Procedure

We scheduled all teams for one 90-minute observation session over a four-month period. We conducted the observation session in a naturalistic office environment. The office was fitted with small cameras and audio recording devices. The subsequent study followed five steps.

First, we collected informed consent and welcomed participants, detailing the purpose of the cameras in the office. The facilitator attached physiological sensors to all members of the team, detailing the purpose of the device. Second, the facilitator read instructions for the first task in the interaction session (adapted from Levenson & Gottman, 1983). The teams were asked to engage in a typical conversation for ten minutes. In line with psychology literature (Levenson & Gottman, 1983) as we utilized this neutral conversation to get a baseline for activation measurements. After 10 minutes, the facilitator ended the conversation. Third, we followed an established methodology for conflict elicitation, that included the teams completing a 'problem inventory' (Levenson & Gottman, 1983), where each person created and rated a list of problems facing the team. The team was then instructed to discuss their list of problems for fifteen minutes, attempting to reach a solution. Here, the facilitator left the room. Fourth, the experimenter re-entered the room at the conclusion of the conflict discussion. Some teams had experienced a lot of confrontation. As such, we followed Levenson & Gottman's (1983) process to facilitate resolving tension from the previous interaction by facilitating a debrief, asking participants to talk about their experience, and answering any questions. Biometric devices were removed. Finally, participants answered a short questionnaire. The process and apparatus used to capture the conflict type, affective, and activation responses throughout each conflict discussion are detailed in Table 1 below.

Response	Process Followed	Apparatus Used
Objective Affect	***Facial Expression Analysis (FEA):*** Video data of conflict episodes were collected for analysis. Teams were seated throughout the interaction session facing each other.	***FEA:***. Two web cameras were attached to tripods and each camera was recording the upper body and facial expressions of participants, providing data for the facial expression analysis. One additional web camera was set up on a different angle to film the whole group, this was the footage shown in the rating dial procedure. Additionally, one audio microphone was placed in the centre of the team. The video data was automatically saved in iMotions Biometric Research Platform (version 9 software, 2019; Copenhagen, Denmark) at a sampling rate of 17ms.
Subjective Affect	***Self-rating of affect:*** Footage of the team's conflict episode was played back to them. Participants were instructed to move a joystick while watching their conflict episode, ensuring the rating represented how they felt during the discussion. The rating was on a scale of one to ten, one as 'very negative', five as 'neutral', and ten as 'very positive'. Moment to moment self-reported affective ratings were obtained.	***Self-rating of affect:*** We adapted Gottman & Levenson's (1985) rating dial procedure. The participant's scores were recorded through a joystick connected to the Continuous Affect Rating and Media Annotation software (Girard & Aidan, 2018), which was designed in consideration of Gottman and Levenson's need for a continuous measurement of affect. The Logitech Extreme 3D Pro joystick was modified (a spring was removed) in order stop the joystick from returning to middle position which would register as a five on the scale.
Activation	***Galvanic Skin Response (GSR):*** In response to a threatening stimulus (such as conflict, anger, frustration or stress) one's autonomic nervous system (the fight or flight response) activates the sweat glands. The greater the emotional arousal, the more moisture is produced, a change we measured by GSR sensors (Balters & Steinert, 2017).	***GSR:*** We used a *Shimmer3 GSR+ Unit* sensor with a sampling rate of 128 Hz to measure galvanic skin response in microSiemens (μS). Two electrodes were positioned to the palmar surface of the medial and distal phalange of the non-dominant hand. The peak data was triangulated with the facial expression analysis. Thus, we could ascertain if a skin response we due to positive arousal (i.e. laughter) or negative arousal (i.e. displays of eyebrow furrowing). This provided a richer analysis, resulting in the number of peaks during positive arousal states 'positive peaks', or peaks during negative arousal states 'negative peaks' (Balters & Steinert, 2017).
Conflict	***Questionnaires:*** Teams completed a survey with demographic measures and Jehn's (1995) eight-item conflict scales (Coefficient alpha = .82 for task conflict and =.87 for relationship conflict).	

Table 1. Data Collection Process and Apparatus

3.3 ANALYSIS

Following case study methodology, we first developed detailed profiles for each team. Each case consisted of detailed visual displays to aid in analysis (Miles & Huberman, 1984). The visual display showed the timeline of the team's interaction session, featuring information on conflict type, affective data, and activation levels (Figure one). This drew together the specific analysis techniques used for the conflict type, affective, and activation data, which we detail in this section. We then compared groups of observations to enabled the emergence of a conceptual model, see Figure three (Yin, 2002).

3.3.1 Conflict type

Conflict type was analysed in two ways. First, we analysed the quantitative ques-

tionnaire data, specifically Jehn's 1995 conflict type scale. The conflict type scale was measured from 1 (little to no conflict) to 5 (high level of conflict). The average relationship conflict = 1.72, (max. 3.75, min. 1), task conflict = 1.98, (max. 4.17, min. 1). Second, we transcribed all interaction sessions verbatim. One of the sessions was conducted in Danish. A research assistant who speaks Danish as a first language translated the observation session into English. This translation was checked by another research assistant who speaks English as a first language and fluent Danish. Any discrepancies were checked and resolved. We then utilized NVivo, a software designed for qualitative research, to qualitatively code the topics throughout the interaction session as either task, process, or relationship conflict. The first author and an independent rater participated in this assessment, and the two raters had an initial percentage agreement of 93%, consistent with inter-rater reliabilities reported elsewhere (Haynie & Shepherd, 2011). Any discrepancies were discussed and recoded.

3.3.2 Affect

To analyse affect we utilized computer-aided facial expression analysis due to its sophistication and reduction in bias compared to manual coding of affect (Warnick, Davis, Allison, & Anglin, 2021). We used the Affectiva AFFDEX algorithm (iMotions A/S, 2019). This algorithm is based on the well validated Facial Action Coding System (Ekman & Friesen, 1971), and it is frequently used to measure participants levels of positive, negative, and neutral affect (e.g. Warnick et al., 2021). AFFDEX measures facial expressions frame-by-frame within a video, and analyses the facial expression's displays and calculates an evidence score for positive, negative, and neutral affect (iMotions, 2019). We ran all video footage of the interaction sessions through the algorithm, which computed data at a centisecond level and produced a graphical representation of the continuous valence score, 0 was negative affect, 5 was neutral affect and 10 was positive affect (see Appendix figure two – data structure).

This analysis was carried out for each team member and added the continuous affective data to the graphical timeline of the conflict episode (Figure one). This also provided two additional outputs. The first was the raw score of how many times an individual emoted positive (min. = 1, max. = 186, average = 58) or negative affect (min. =1, max. = 216, average= 82). The second was the percentage of the conflict episode an individual emoted positive, negative, and neutral affect. This was a more meaningful metric as it normalized the data, considering that conflict episodes varied by one to two minutes across cases.
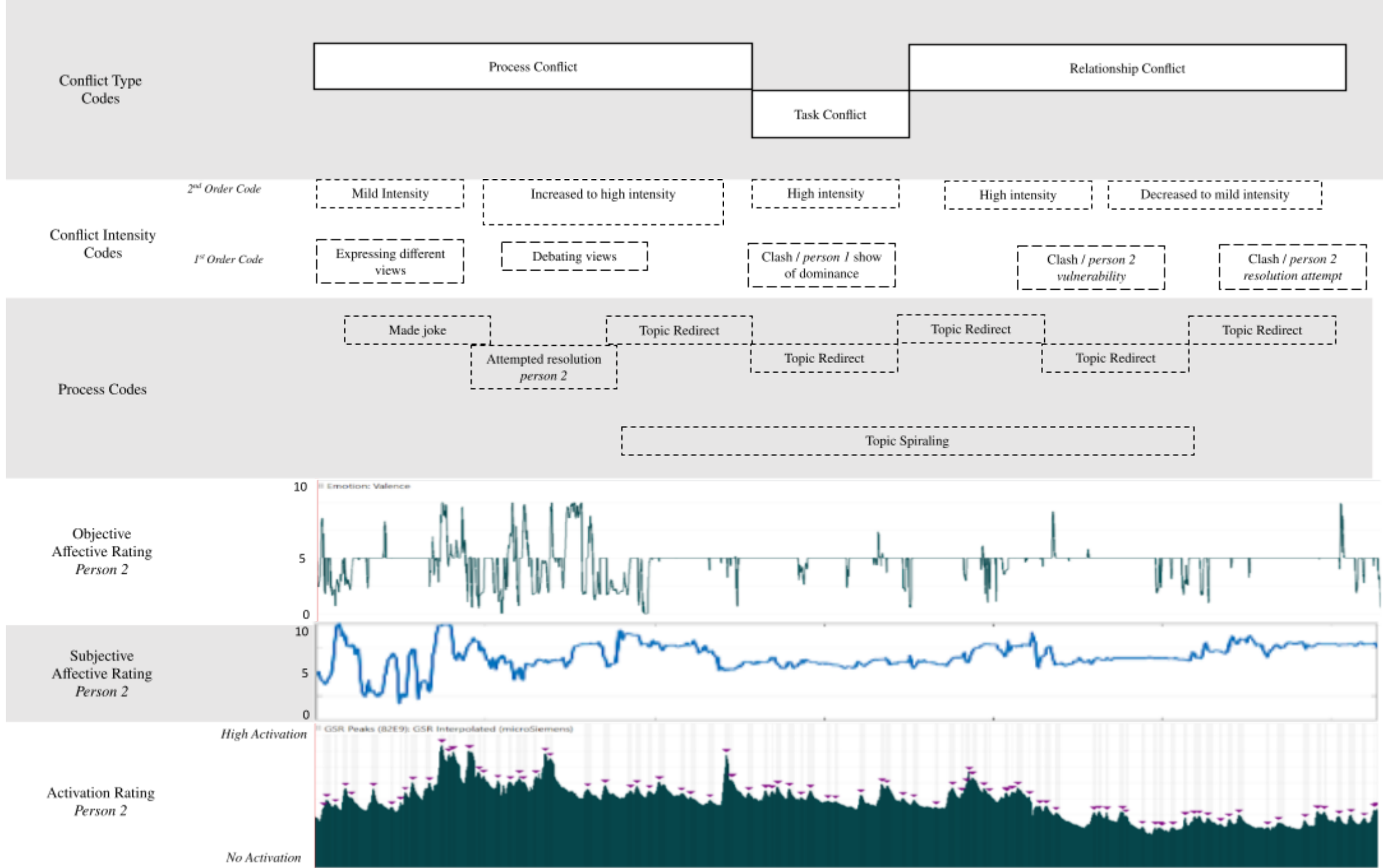
Figure 1. Example of annotated visual timeline person two, case 7

Finally, we analysed these outputs in two further steps. First, in line with psychology research (Gottman & Levenson, 2000), from the raw affective scores, we created an aggregate ratio of positive to negative affective occurrences for each team. Second, following latest guidance (i.e. Warnick et al., 2021) we aggregated the affective percentage data to the team level to get a mean percentage of positive, negative, and neutral affect throughout the team's interactions.

3.3.3 Activation

We processed each respondent's physiological data to show their level of activation throughout their conflict episode. First, we ran standard trough-to-peak analysis, focusing on the phasic component of the signal which is tied to eliciting events (Gatti, Calzolari, Maggioni, & Obrist, 2018). When activation is high, there is a significant skin conductance peak. Hence, this analysis shows the number of significant skin conductance peaks, where the amplitude surpassed the threshold of 0.01 μS (Benedek & Kaernbach, 2010). This provided a score for the number of instances of high and low activation a respondent experienced throughout their interaction. Second, we calculated the 'peaks per minute' metric. Given the length of the conflict episode varied by a few minutes, we took total number of significant peaks and divided this by the number of minutes of the conflict episode, providing us with a 'peaks per minute' result. This enabled us to more accurately compare activation cross cases. Third, we developed a coding file which triangulated each participant's affective score with level of activation. The MATLAB script and the respective data was run through the MATLAB software package. This code triangulated each individual's second by second affective data with their second by second activation data and provided us with the number of positive, negative, and neutral peaks each participant experienced during their conflict episode. We input these three results into all case files, and input the graphical affective and activation timelines into the visual timeline with the qualitative conflict type data, and process notes on the interaction (Figure one).

3.3.4 Conflict Intensity and Process

Once visual timelines were developed for each individual, and nested within case profiles for each team, the data were analysed following an iterative process. First, all conflict episodes were watched in full, with the affective and activation data on display, continuously fluctuating throughout the team's interaction. We first coded for conflict intensity. In line with existing literature (Todorova et al., 2014), we coded conflict expressions that denoted intense conflict (e.g. criticize, argue and clash), as well codes the denote mild conflict intensity (e.g. debate, express differing viewpoints, and disagree). Second, we coded the visual timelines with process oriented codes. Namely, we noted when a participant changed the topic, when conflict topics began to rapidly increase without resolution, or when conflict escalated (from mild to intense) or deescalated (intense to moderate). Third, we performed cross-case comparison, contrasting the level of affect, activation, intensity, and process codes between cases with differing levels of

relationship and task conflict, this enabled the emergence of new findings (Eisen-hardt, 1989; Miles & Huberman, 1984). This led to the development of our data structure outlined in appendix figure two. Fourth, we iteratively reviewed the data structure and annotated visual timelines to understand the connections between our variables of interest, which allowed us to define an overall model of conflict type, affect, and activation (Figure three). Fifth, we iteratively reviewed all cases against the model, refining the relationships between the variables and ensuring conceptual robustness. Finally, the preliminary model and findings were discussed among the research team, and any differences of opinion were explored, resulting in minor refinements to the clarity of the final model.

3.4 FINDINGS

From our analysis, we developed an overall model, the activated affect and conflict process model (Figure three). Here a close relationship between conflict type and activated affect (a close interaction between affect and activation), shape conflict intensity and subsequent progression of the conflict process. Second, we developed a typology of the conflict styles at play during conflict. This describes a set of interactions between the various levels of activation and types of affect, with distinct implications for conflict intensity and conflict process. While the model emerged inductively from our study, we feature it upfront, alongside our data structure, to provide readers with a roadmap of our core findings.
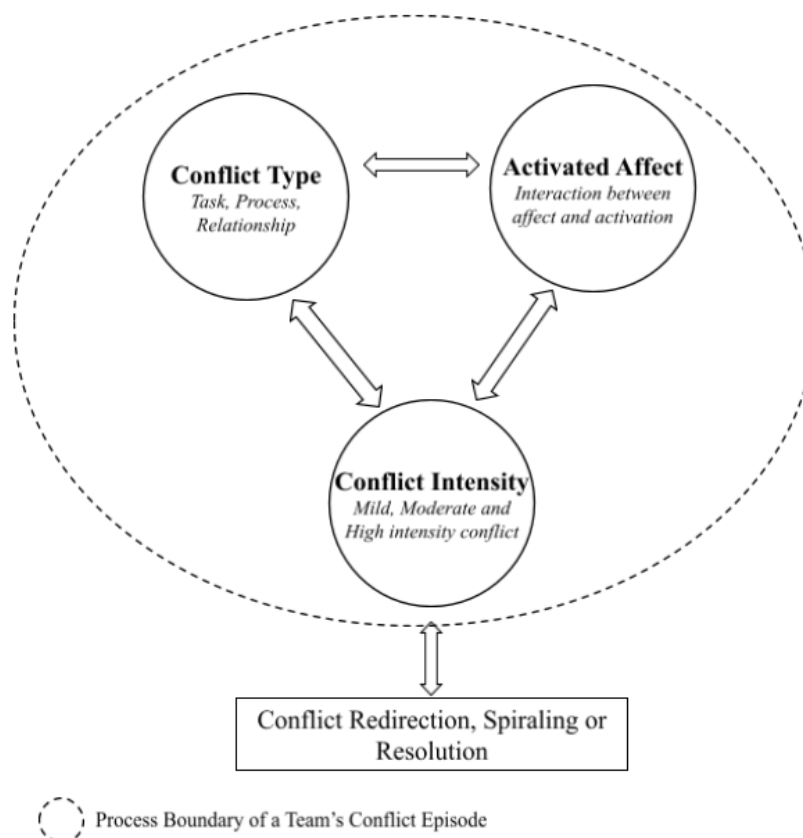
Figure 3: Affective stress and conflict process model

3.4.1 Conflict Type, Affect, and Activation: The Importance of a Process Lens

The first main result was the presence of both relationship and task conflict, to varying levels, within and across all cases. The average quantitative self-report of relationship conflict = 1.72, (max 3.75, min 1), task conflict = 1.98, (max 4.17, min 1). As we iteratively compared the quantitative conflict scores with our qualitative conflict codes across all cases, we were surprised to find contrasting results. For example, in *case 1*, Mark said to teammate Julie (following prior works all participants have been anonymised and we use pseudonyms throughout): *"I get angry at you when you talk over me"*, and went on to discuss further relationship conflict topics. As did Sam from *case 2*, when he said to his teammate Daniel, "[I'm concerned] *you want to move to another city to be with your girlfriend*". Yet, both Mark and Sam reported '*none*' to '*very little*' relationship and task conflict on Jehn's (1995) conflict scale. This highlights an important disparity between the quantitative self-report and qualitative independently coded conflict measures. Namely, it reveals that when the participants in our study retrospectively measured their conflict levels, they under reported both how much and the intensity of the conflict in their teams. This emphasized the importance of adopting a process lens to investigate conflict over an entire episode, instead of relying solely on static, retrospective conflict measurement, which did not accurately reflect the levels and types of conflict present in the teams' interactions.

In addition, we observed varying levels of affect and activation in every conflict episode, regardless of the conflict type; and did not find a specific correlation between negative affect and relationship conflict. Starting with affect, we found that at the individual level (Appendix figure two – affective range in data structure), every individual had at least one display of positive affect during their conflict episode (min. 1, max. 186, average 58), and at least one display of negative affect (min. 1, max. 216, average 82). Similarly, we found that across all conflict episodes, all team members experienced some instances of activation (min. 34, max. 214, average 101). Importantly, and following our initial analysis of conflict type, we also found a high level of discrepancy between the continuous objective affective scores and the continuous subjective affective scores (Figure one). Specifically, there were instances when a participant's objective affect became very negative, yet when they evaluated their own subjective affect, they rated their scores as very positive (Figure one).

At the aggregate team level, the mean percentage of the conflict episode spent emoting positive affect = 10.89% (min. 0.52%, max. 22.59%), negative affect = 12.84%, (min. 1.32%, max. 24.44%), and neutral affect = 75.40% (min. 6.77%, max. 94.10%). Here, each team had a differing ratio of positive to negative affect. For example, in *case 4* for every one occurrence of negative affect, there were 3.6 occurrences of positive affect (1:3.6). In contrast, in *case 1* for every one occurrence of negative affect, there were only 0.8 occurrences of positive affect (1:0.8). Notably, this ratio corresponded to the conflict intensity in each

case, with *case 4* having low conflict intensity, and *case 1* having high conflict intensity; suggesting a link between negative to positive affect ratio and subsequent conflict intensity. This aligns with the wider psychology literature, which finds a ratio of 1:5 (negative to positive) necessary to maintain a 'positive relationship trajectory' (Gottman & Levenson, 2000), while lower ratios result in stonewalling, criticism, defensiveness, and contempt (Gottman & Levenson, 2000). Critically, these differences in affect were closely linked to changes in activation. Thus, we observed overall interaction between all aspects of conflict type, affect, and activation, rather than the limited interaction between relationship conflict and negative affect assumed in prior literature (see Theoretical Development). Further, this relationship appears to defy simple variance type correlation, and rather demand a process understanding.

3.4.2 Activated Affect in the Conflict Process

Critical to understanding the above relationship between conflict type, affect, and activation in a process context, was a close interaction between affect and activation, which we term 'activated affect'. The relationship between activated affect and conflict type provided a robust basis for explaining subsequent conflict intensity and processes. Examining affect and activation together with the visual timelines of conflict type and conflict process, it became evident that there were particular responses adopted by team members when they experienced high and low activation, and emoted negative, neutral and positive affect. These could be inductively clustered into thematically coherent conflict styles. For example, when an individual experienced high activation, but emoted neutral affect, they exhibited what we call a *poker face* (Table two) conflict style. This conflict style was evident across a number of participants in a number of cases, for example, we observed this with Chris in *case 3*. When Nick was attacking him, his expressions became very neutral, but at the same time experienced high levels of activation. We also observed this conflict style in other cases when a person likely felt they were being attacked, as they attempted to appear more composed than they really were.

A second example of a distinct conflict style was evidenced by Mark in *case 1*. Namely, in response to negative feedback about his sales letter, Mark also experienced high levels of activation (Appendix figure four). Yet, instead of emoting neutral affect, he began to emote negative affect and raised his voice. This was an example of what we call *activated negativity* conflict style. In this instance, the conflict intensity increased in line with activation from mild to high as he became hostile and argumentative. Notably, the range of observed conflict styles closely corresponded to the interaction between negative, neutral, and positive affect and high and low activation, with each combination having a distinctive style and associated pattern within the process data. Importantly, the patterns associated with each conflict style could be defined and repeatedly identified within the data, providing the basis for a typology as outlined in Table two. Here, for each conflict style we outline the indicators from our data as well as the observed

impact on the team level conflict intensity and process.

Activation in Conflict		
	Low Activation	High Activation
Negative	**Shallow Negativity** Individuals have low levels of activation while emoting negative affect. The lack of activation may be indicative of the individual being bored, tired or pessimistic in these episodes. *Impact on team process:* High likelihood that other team members will experience social contagion and respond also in shallow negativity, but without activation this may not increase the intensity of the conflict episode. In a mild intensity conflict, shallow negativity may occur throughout a debate, and progress to activated negativity if the team begins to argue or clash.	**Activated Negativity** Individuals have high levels of activation while displaying negative affect. The activation occurs in response to negative stimuli, either another team member's negative affect, or the perception of a threat in the conflict episode. The individual may be annoyed, hostile, discontented or distrustful. *Impact on team process:* High likelihood of social contagion, other team members may also adopt activated negativity, which may increase the conflict intensity, or a team mate may redirect conflict to try to decrease intensity
Neutral	**Ambivalent** Individuals display neither positive nor negative affect and have low activation. This neutrality and lack of activation may be indicative of the individual feeling apathetic, disappointed or dissatisfied in these episodes. *Impact on team process:* This is typically present in conflict episodes that have only mild intensity as the team members may be apathetic about the outcome, and likely will not argue, clash or criticise. Other team members may perceive this response as a lack of engagement, and may become angered by the apathetic style and become negative in response.	**Poker Face** Individuals have high activation while displaying neutral affect. This is seen when an individual wants to 'save face', and does not want to give a 'tell' about how activated they are. In both instances, high physiological activation is masked with neutrality. The individual may be expectant, worried, or suspicious in these episodes. *Impact on team process:* Sometimes poker face can decrease the conflict intensity as high neutrality can reduce other team member's negative affect. Conversely, if they are intentionally avoiding showing their activation, there is likely a mistrust between team members and this may cause a redirection of the conflict to relationship conflict, which can increase negative affect.
Positive	**Surface Acting** Individuals use intentional displays of positive affect to hide negative affect. Thus, they engage in surface positive affect, and due to a lack of activation likely do not feel the positive emotions associated with positive affect. The individual may appear polite in these episodes. *Impact on team process:* If deployed when other team members display shallow negativity or activated negativity, it may reduce conflict intensity to moderate or mild.	**Genuine Positivity** Individuals display genuine positivity during conflict. Genuine positivity occurs when individuals emote positive affect with high activation. This usually accompanies humour and occurs throughout laughter. The individual may be light hearted, interested or joyous in these episodes. *Impact on team process:* Genuine positivity rarely occurs when other team members are displaying negative affect. This positive affect indicates high team trust, and kinship, and is a useful tool in resolving and/or decreasing intensity of conflict episodes. Some members may use laughter and humour to decrease conflict intensity.

*(Row grouping label: **Affect in Conflict**)*

Table 2. Typology of Affective Conflict Styles

3.4.3 Conflict Intensity and Process

Following our typology findings, we were able to explain how relationships emerged between conflict type, activated affect and subsequent conflict intensity and conflict process. Namely, we found that conflict type and activated affect interacted to shape conflict intensity throughout the conflict episode, leading to three main conflict processes: conflict redirection, conflict spiralling, and conflict resolution (Figure three). Considering the process of conflict resolution is well researched (e.g. Behfar, Peterson, Mannix, & Trochim, 2008; Greer, Jehn, & Mannix, 2008), we focus on the novel processes of conflict redirection and spiralling. First, we observed a process of conflict redirection. Conflict redirection occurred when a team member redirected a topic of conflict (e.g. they felt their office was too

loud), to another topic (e.g. they did not like how their co-worker spoke to them), without discussing or reaching a resolution for either topic. The interaction between Mark and Julie from *case 1* exemplifies this:

Julie: Let's talk about the sales letter. I feel secure when I have your opinion. Do you understand what I am saying? *(topic 1 – sales letter, 'task')*

Mark: *Pause.* No. Do you think my sales letter was too harsh?

Julie: Yes.

Mark: *Pause & Redirect.* Well the other week I got furious when you didn't put [client name] on speaker, and you just kept talking. I get angry at you when you talk over me *(topic 2 – interpersonal dynamics, 'relationship')*.

In this example, Mark redirected the topic from a critique about his sales letter, to a discussion about his anger towards Julie. He redirected the focus of the conversation from himself (*his sales letter was harsh*) onto Julie (*he was furious with her*) without discussing or reaching a resolution on the initial topic (*the sales letter*). In this example, Mark and Julie's activation levels were both initially low and increased significantly after Mark redirected the conflict, Mark's affective conflict style changed to activated negativity (Appendix figure four), whereas Julie adopted a poker face response (Table two). Their remaining conversation changed from being coded as medium intensity to a high-intensity conflict episode, namely what was initially coded as disagree, changed to criticize, denoting high-intensity conflict (Todorova et al., 2014). However, this was not always the outcome of a conflict redirection. For example, a team could move from high intensity to moderate or mild intensity. This interaction from *case 3* exemplifies this when the team discussed a legal issue with product development.

Nathan: I think we have to realize how complicated this problem is. Uh, I think there's a big cohesion between what I initially said and what they [the lawyers] advise us to do. *(topic 1 – product development, 'task')*.

Stephen: *Interjection & redirect.* Can I say something? You put in information, but at some point I am.. I'm allowed to say, OK, that's fine if you've told me this. And at this point, I'm willing to take the risk even that you tell me. But that's what I sometimes feel that you have to consider, because I have to consider that you will not take a choice unless you have checked everything. But you have to consider that I'm willing to do it before you have checked everything. You understand that..*(topic 2 – team power struggles, 'relationship')*

Nathan: I'm a little bit sorry that it seems like you… basically… I treat you like a child. Um, uh, it's not my, uh, perception that I try to apply my ethics and my moral on you…

Micah: *Redirect.* Ok, I think we are detouring. *(Redirect back to original issue of product development – redirect to 'task')*

Eva: *De-escalation from high to medium intensity.* It was, I think it was a good stepping stone, so it was a good example, because I feel I think that we all kind of understand the issue and it comes in different variations

during our [product development].

In this example, the activated negative affect was initially increasing in the exchange between Nathan and Stephen, both were shifting from shallow negativity to activated negativity (Table two). Yet, when Micah interjected to redirect the conflict back to product development, and Eva adopted a surface acting style to express support of the redirection, Nathan and Stephen's activation levels decreased, moving them back to shallow negativity (Table two). The team then continued to talk about the issues with product development in order to reach a resolution with lower intensity.

Second, we observed a process of conflict spiralling. Conflict spiralling was the continued repetition of redirection, and in our data it always corresponded to increased conflict intensity. Specifically, the conversation turned from being coded as a debate to being coded as an argument, and typically corresponded to high activation and negative affect from the team members. Here, team members would continuously redirect the conversation to new topics without ever reaching a resolution or tracing back to the original issue. For example, see this exchange between Nick and Chris from *case 4*. At first, Nick had a shallow negativity conflict style, which changed to an activated negativity response as the conflict spiralled (Table two). Whereas Chris initially had a surface acting affective response, which changed poker face, and then to activated negativity as his positive affect changed to neutral and then negative affect as his activation levels increased (Table two). Here, the topic is redirected continuously and the team ends up talking about a wide range of different issues, but never resolving any of them.

Nick: Shit, man... today [you are complaining] about the work environment. You didn't even work? *(topic one – Chris doesn't like their work environment, 'process')*

Chris: No no no, no no no, but I was trying to concentrate. That was it. *Laughs* *(low intensity – surface acting)*

Nick: What you need is a workspace, it is never going to be that.

Chris: I'm not saying that either, it is not because I'm throwing it at you and says it as if it is you who is the problem.

Nick: *Redirection.* But could you stop complaining about it? Because I am growing tired of listening to you... *(topic 2 – dissatisfied with partnership, 'relationship'. Moves from low to high intensity – activated negativity)*

Chris: No no, that is not what I am saying either *(activation levels increase – poker face, then to activated negativity as Nick talks)*.

Nick: *Redirects.* Because this is what keeps me from moving on. It is due to you constantly walking the same walk. We just fixed the issues. We just talked. We literally just spend all of last week fixing it. Now you walk the same walk, again, and rotates it all again. I am becoming crazy in my head. Because then it is just a new issue. Today it was the music. That is the first time I have heard of this. Now, it is just a new issue we can focus

> on. You have to start looking at yourself. *(topic 3 – Chris annoying Nick, 'Relationship'. Activation levels for both people increase. Conflict increases to high intensity).*

Hence, our data shows that affective conflict responses (Table two) are critically related to fluctuation in conflict intensity and progression of the conflict process over time, particularly with respect to conflict redirection and conflict spiralling. Specifically, we found that when a team member engaged in an activated negativity conflict style, with negative affect and high activation, the conflict intensity increased and the conflict was redirected to a higher intensity topic (for example, *case 1*). In contrast when a team member engaged in a genuine positivity response style, with positive affect and high activation, the intensity of the conflict typically decreased, and the conflict was either resolved, or redirected to a lower intensity topic, as in *case 2*. Finally, when both team member's engaged in an activated negativity conflict style, with negative affect and high activation, intensity substantially increased and the process began to spiral through continuously shifting conflict topics (as in *case 3*). Thus, in order to understand the development of conflict intensity, and the wider conflict process it is necessary to understand the interaction between conflict type and activated affect over time.

3.5 DISCUSSION

This research set out to explore the process, presence, and consequence of activation and affective dynamics during conflict episodes. Through a series of 18 in-depth observations of organizational teams, we investigated four major assumptions of conflict research, and developed a model of activated affect and conflict process. The model details the relationship between affect, activation, and conflict type, in relation to subsequent conflict intensity and process progression. This builds on our proposed activated affect typology that consists of the six activated affect responses throughout team conflict episodes, each distinguished by differing levels of activation and positive, negative or neutral affect. Finally, we explain how these relate to fluctuations in the intensity of the conflict episode, as well as processes of conflict redirection, spiralling, and resolution.

Our work offers three important theoretical contributions. First, we directly refute two of the major assumptions in OB research: i) that relationship conflict—as opposed to task and process conflict— will feature high levels of negative affect (Amason, 1996); (ii) most conflict episodes will not feature significant positive affect (Schweiger & Amason, 1994). Specifcially, we found that regardless of the conflict type, all teams emoted varying levels of negative, neutral, and positive affect continuously throughout their conflict episode. Further, while recent research has investigated positive affect as the missing piece of the task conflict puzzle (Mauersberger et al., 2020), we find that in some episodes of relationship conflict there were also high levels of positive affect. This further draws attention to the under examined and essential role of positive affect in conflict ((Mauersberger et al., 2020; Todorova et al., 2014). This has implications for

the examination of positive affect, particularly in relation to its potential to aid in 'repairing negativity' in conflict (Gottman et al., 2015), as well as the role of all types of affect across conflict types. Hence, our findings point to the need for significant reconceptualization of team conflict, and its associated variables in OB. To this end we propose the activated affect and conflict process model to better conceptualise the distinction between key variables.

Second, recent research (e.g. Todorova et al., 2014) posits that activation may be an important variable in unpicking the mixed empirical and theoretical findings from recent meta-analyses (De Dreu & Weingart, 2003; Wit et al., 2012). Our findings support this by illustrating a critical interaction between affect and activation with implications for conflict intensity and conflict process. Specifically, we introduce the concept of activated affect to emphasise this interplay. Based on this, we suggest that there are two important questions in a conflict episode. First, what type of conflict is this? Second, what is an individuals activated affective conflict style throughout this conflict? This is theoretically important given Jehn's (1995; 1997) typology of conflict types is the dominant explanation for why conflict can be performance-enhancing or reducing, even in spite of mixed meta-analyses support for this typology. We provide evidence that activated affect is an important additional variable at play throughout a conflict episode.

Hence, we present an alternative theoretical explanation for why some episodes of task and process conflict, which can be considered beneficial (Simons & Peterson, 2000), may lead to negative team outcomes. This is because some team members may have a negative activation response to task or process conflict, which leads to increases in conflict intensity and decreases the likelihood of a resolution. This development also makes sense when considering broader empirical findings that show negative affect fully mediates the relationship between process conflict and group performance (Greer & Jehn, 2007). Further, we find that in both the poker face and activated negativity conflict styles (Table 2), an individual experiences high levels of activation. This highlights the potential for longer term impacts on individual health and well-being through increased stress, offering a direct link to prior work highlighting such health outcomes from conflict (Spector & Jex, 1998). Here, high levels of activation show the flight or fight response has started, and considering we saw this across all conflict types, it is unsurprising that scholars have found a positive and moderate correlation between organizational conflict and anxiety, physical complaints, and the exhaustion dimension of burnout—all logical consequences of extended periods in fight or flight mode (De Dreu, van Dierendonck, & De Best-Waldhober, 2004; Penney & Spector, 2005; Spector & Jex, 1998). Thus, the introduction of activated affect serves to logically link two key elements in the conceptualisation of conflict and offer an explanation for the development of major conflict outcomes.

Third, our findings point to a refutation of a key assumption regarding the measurement of conflict. Specifically, that static, retrospective conflict measures can adequately capture the conflict process (e.g. in Jiang et al., 2012). Critically,

we found little correlation between both objective and subjective process measures and static quantitative conflict scores (Jehn, 1995). There was also high levels of inconsistency in some individuals self-reported subjective affect scores, and the objectively analysed affective scores. This is particularly problematic in research that uses subjective cognitive performance evaluations, as these evaluations may be susceptible to influence from perceived negative affect in conflict (Ferris, Judge, Rowland, & Fitzgibbons, 1994; Wit et al., 2012).

Further, our results highlight the process aspect of conflict progression. Specifically, the processes of conflict redirection and spiralling were associated with dynamic fluctuations in conflict intensity. When we view this in light of other conflict research (e.g. Greer & Jehn, 2007; Jiang et al., 2012), we posit that it is not necessarily high levels of negative affect that make relationship conflict detrimental, but rather when participants experience activated negativity and increase the intensity of the conflict by criticising, arguing or showing hostility. Therefore, while extant research has developed a comprehensive understanding of conflict type, the static measurements contradict the dynamic emotional system lens evident in OB conflict research (c.f. Cronin & Bezrukova, 2019, Yang & Mossholder, 2004), and do not adequately capture the impact of dynamic changes during a conflict episode (see Greer & Jehn, 2007; Jehn & Mannix, 2001; Jian et al., 2012). Thus, our findings point to the need for major revaluation of how conflict is measured and modelled, particularly in light of advances in facial expression analysis and biometric research tools.

3.5.1 Managerial implications

Although more research is needed to understand the performance consequences of each type of activated affect conflict style (Table 2), our findings suggest that managers should find strategies for monitoring affective dynamics during team conflict. We found that asking team members to rate how much conflict there was in their team was often at odds with the amount of activation team members felt during conflict. This highlights the subjective nature of conflict, and draws out the need for teams and managers to be able to understand the nature of affect and its impact on the process of team conflict. This may help organizations to more effectively train leaders and team members to recognize when conflict has become disproportionately based in negative affect, and to better understand the physiological stress this will likely cause. Importantly, training teams to increase the ratio of positive to negative affect may minimize the physiological stress involved in team conflict, which has important ramifications for reducing employee burnout (Spector & Jex, 1998).

Additionally, prior research has suggested that once relationship conflict emerges, an avoiding response may help to increase team functioning (c.f. De Dreu & Van Vianen, 2001). Practically, this finding encourages leaders to manage their teams by avoiding relationship conflict altogether. Our findings suggest that instead of avoiding conflict, which likely enhances physiological stress in team interactions

through redirection, it would be preferable to train managers in how to adopt and encourage a genuine positivity response style. Specifically, employing higher levels of positive affect, reducing conflict redirection and spiralling, and enhancing techniques to reduce physiological strain from conflict (like breathing techniques to reduce the fight or flight response).

3.6 LIMITATIONS AND CONCLUSION

While the explorative approach we adopted has several advantages, such as enabling us to synthesise detailed, rich, process data, through theoretical abstraction, it must be seen in light of three core limitations. First, the procedure of conflict elicitation may limit this study. While we utilized conflict elicitation procedures used in psychology (Levenson & Gottman, 1983), the facilitation of naturalistic interactions in a research setting is nevertheless difficult. We attempted to mitigate triggering of unnatural interactions by using discrete cameras and by having the facilitator leave the room during the conflict episode (as in Levenson & Gottman, 1983). Many cases did go on to have periods of intense conflict, yet nevertheless, future research could benefit from collecting data even more unobtrusively, such as utilizing recorded data from naturalistic interactions like an online meeting with participants looking directly into the camera. However, this would substantially increase difficulties in measuring physiological activation. Psychology scholars have built fit-for-purpose rooms that simulate hotel rooms, retrofitted with cameras and recording devices to try and encourage naturalistic interactions for couples to observe conflict (Gottman & Schwartz, 2018). Perhaps future research could invest in long term partnerships with organizations to create purpose-built rooms in a suitable office building in a similar fashion. Second, our sample focused on a limited set of semi-autonomous teams. Future work could increase generalisability by investigating work teams from large corporations, specifically researching teams across different industries, cultures, and teams that have been created solely for a project but may eventually disband. There may be important differences in how these teams act and their affective dynamics. However, our current work provides a key foundation for such elaboration by highlighting the key variables that might be used in, for example, the identification of extreme cases.

Third, in order to enhance the naturalistic environment, we did not instruct participants to stop gesticulating when speaking. Due to this gesticulation, artefacts were likely inadvertently created in the physiological data. While we did control for this in the statistical biometric analysis, future research could investigate the use of physiological sensors which may create less noise in the data due to hand movements (Lei, Sala, & Jasra, 2018). However, this is an ongoing and unresolved challenge in current studies of activation.

To conclude, team conflict is an inevitability in the workplace. Our research has contributed to unpacking the often conflated variables of conflict type, affect, and activation that occur throughout conflict episodes in work teams. This pro-

vides a platform for three main contributions. First, we evidence how conflict type and affect are two empirically and theoretically distinct variables, which interact during a conflict process. This refutes a number of major assumptions about the relationship between conflict type and affect, as well as traditional static, retrospective approaches to conflict measurement. In particular, we show that positive, negative, and neutral affect fluctuate continuously across all conflict types. Second, we introduce the activated affect and conflict process model, which extends Jehn's (1995; 1997) seminal conflict typology by highlighting a three-dimensional view of the conflict process: conflict type, affect, and activation in relation to conflict intensity and conflict process progression. Finally, we introduce the typology of affective conflict styles to explain how different conflict styles can lead to fluctuations in conflict intensity as well as developments in the progression of the conflict process itself, including conflict resolution, conflict redirection, and conflict spiralling. We hope that this work provides a platform for further study of conflict as a complex affective process, where it's not just what you say that is important, but also how you say it.

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Positive Affect
- Display of positive valence through facial expressions - smiling, happiness, joy
- Uses humour, laughter in conversation
- Positive Valence occurrences in every participant *max 186, min 1, average 58*

Neutral Affect
- Periods in conflict episode with participants displaying neutral valence
- Self-reported neutral valence
- Evidence of 'indifference' or feeling 'nothing in particular'

Negative Affect
- Displays of negative valence objectively through frowning, brow furrowing and subjectively through negative rating
- Negative valence occurrences in every participant, *max 216, min 1, average 82*

High Arousal
- Intermittent episodes of high physiological arousal
- Physiological arousal occurrences *max 213, min 34, average 101*

Low Arousal
- Intermittent episodes of low physiological arousal
- Varying periods of low physiological arousal (e.g. low heart rate variability, now galvanic skin response)

Relationship conflict was evident in some conflict episodes & self-reported: *max 3.75, min 1, average 1.72*

Process conflict consisted of disagreements about the team processes

Task conflict was frequent in conflict episodes, and self-reported: *max 4.17, min 1, average 1.98*

Conflict Redirection The approach started with (1) topic selection, then either (2) increase or decrease in intensity of that topic, resulting in (3) topic redirect or resolution

Conflict Spiralling If a team escalated their conflict, and continuously redirected to a new topic with reaching a resolution, this resulted in topic spiralling. The spiralling of multiple topics without a resolution typically increased conflict intensity.

Affective Range → Activated Affect

Activation

Conflict Type → Conflict Type, Intensity and Process

Conflict Process and Intensity

Appendix figure 2. Data Structure

Conflict Type

Sales letter - Process

Interpersonal - Relationship

Conflict resolution style - Relationship

Conflict Process

Initiation of conflict topic

Conflict redirect (*Mark*)

Conflict redirect (*Mark*)

Conflict redirect (*Mark*)

Conflict redirect (*Julie*)

Conflict spiraling

Julie activation

Low activation. *Surface acting*

Fight or flight response activated. *Poker face*

Fight or flight response activated. *Poker face*

Julie

Let's talk about the sales letter. I feel secure when I have your opinion. Do you understand what I am saying?

Yes

I am sorry.

Instead of noticing and holding a grudge, we need to say problems when they happen

Mark

No. Do you think my sales letter was to harsh?

Well I have to say, I got furious the other weeks when you didn't put [*the client*] on speaker, you just kept talking. I get angry when you talk over me.

These things happen. I was furious in the moment

Mark activation

Fight or flight response activated. *Activated negativity*

Fight or flight response activated. *Activated negativity*

Appendix figure 4. Relationship between activated affect and conflict process - Mark and Julie's interaction

4 | PAPER TWO

Not All Co-Founder Exits Are Equal: How Shared Affect and Shared Cognition Influence Co-Founder Exits

Abstract

Extant research on co-founder exits present contradicting results: exits can either lead to venture failure, or enhance the effectiveness of the remaining team. Using in-depth, qualitative case studies of dynamic affective interactions and follow-up interviews from nine founding teams over twenty months, we examine how differences in teams' shared affect and cognition before a co-founder exit subsequently impacts how co-founders exit, and the impact of their exit. We develop a model of affective and cognitive dynamics in the co-founder exit process. We find that patterns of shared affect and cognition cause different team vulnerabilities. These vulnerabilities lead to differing team behaviours which in turn influences team conflict, exit speed, co-founder commitment and co-founder relationships. Our findings have important implications for co-founder exit literature, as we propose why some exits lead to failure while others improve the venture overall.

4.0 INTRODUCTION

Founding teams change over time, with a significant amount experiencing a co-founder exit at some point in their founding journey (e.g. 50% of teams in Breugst, Patzelt, & Rathgeber, 2015). Co-founder exits can have serious personal and relationship consequences for the departing member (Breugst et al., 2015), and can significantly impact the venture, potentially derailing the business (Hellerstedt, 2009). Thus, understanding how co-founder exits impact founding teams and the relationship in founding teams is of critical theoretical and practical importance.

Prior literature has typically focused on co-founder exits in the context of self-employed, lone founders (cf. Wennberg et al., 2010; Hessels at al., 2018), where to exit is to fail and to remain is to succeed (Wennberg & DeTienne, 2014). However, this dichotomous lens has contributed to the development of a number of conceptual and empirical contradictions in the literature. For example, Bamford et al., (2006) demonstrate that co-founder exits have deleterious consequences for remaining team members due to resource loss, yet Chandler et al., (2005) find that the exiting co-founder is usually the weakest member and thus by leaving, can actually enhance team functioning (Busenitz, Fiet, & Moesel, 2004; Boeker & Karichalil, 2002). Critically, current co-founder exit theories do not allow for these contradictions to be adequately resolved (Gregori & Parastuty, 2021), because very few account for team processes, such as team member's cognitive and affective states leading up to and result from, the co-founder exit, as highlighted by Patzelt et al. (2020).

In order to account for these essential affective and cognitive processes that shape founding teams social interactions (e.g. Gregori & Parastuty, 2021; Patzelt et al., 2020), we aim to integrate co-founder exits with insights from team process literature. We build on the work of Breugst et al. (2015) who highlight the central role of positive and negative interactions as team process antecedents to co-founder exits. Further, shared affect and cognition are known team processe antecedents to team performance (Gevers et al., 2021), cohesion (Magee & Tiedens, 2006), trust (De Jong & Dirks, 2012), and turnover (Levine & Choi, 2004); and thus key to understanding how team processes might shape the co-founder exit process (Breugst et al., 2015). Given this team process lens, our research is guided by the following questions: *in what ways do affective and cognitive processes in team interactions lead to co-founder exits, and how and why do the relationship outcomes of these exits differ between founding teams?*

Due to the lack of prior theory linking co-founder exits and team processes, a qualitative approach is required. We conducted a longitudinal inductive study of nine founding teams who experienced a co-founder exit across a twenty month period (some co-founder's exited within 3 months, some at at 18 months). All teams are in Denmark, 90% are based in Copenhagen. We utilized observation sessions that enabled us to collect affective and cognitive data before a co-founder exit, and

then tracked the teams over the coming months. After a co-founder exit, we performed semi-structured interviews with those who left and those who remained. This revealed considerable differences the affective and cognitive processes and emphasised their implications for co-founder exits. Based on these results we develop a model of affective and cognitive dynamics in the co-founder exit process, and from this derive several substantial theoretical contributions.

First, we make an important empirical contribution in the field of *entrepreneurial exits*. Namely, with the notable exception of Breugst et al. (2015), almost all previous work has looked at exits from the lone founder's point of view (cf. Wennberg et al., 2014; Hessels et al., 2018). Further, researchers have recently called for utilisation of micro-level data across different levels of analysis to further understand entrepreneurial processes (Patzelt et al., 2020). Our work contributes to a better understanding of entrepreneurial exits, by investigating the affective dynamics at play in co-founder exits, utilising continuous affective data at the team level.

Second, we contribute to the *entrepreneurial affect* literature by, for the first time, characterising levels of shared affect as a central variable in co-founder exits. Prior work has overwhelming framed negative affect as detrimental for founding teams, harming social ties (Lucas & Diener, 2003), reducing satisfaction with business performance (Delgado-García et al., 2012) and reducing business growth (Gorgievski et al., 2014). Yet, we highlight how negative affect is not uniformly "bad" and positive affect uniformly "good", and subsequently introduce a new way of understanding the construct of affect at the team level based on shared affect. Our findings therefore question prevailing assumptions about the deleterious role of negative affect in a co-founder exit (Breugst et al., 2015; Fodor & Pintea, 2017). This has important implications for theorising as we see teams with high levels of negative affect (conflict, stress, and frustration), that still experience a high level of commitment to the venture and sustained friendship with one's co-founders, even after exit.

Finally, we contribute to literature on *shared cognition*. In line with previous research that finds low shared cognition in work-groups decreases performance (Jehn, Thatcher, & Rispens, 2010), we find that low shared cognition goes on to significantly impact future team interactions throughout the co-founder exit process. This substantially extends prior literature that suggests affect and cognition are secondary to perceived justice (e.g. Breugst et al., 2015). We provide evidence that teams with low shared cognition will face challenges when they encounter events which require cognitive consensus, which can trigger an exit. Hence, we resolve contradictions in prior literature by explaining how an exit for one team may be negative but for another team may be positive in terms of relationship outcomes.

4.1 THEORETICAL CONTEXT

While there is a variety of ways to describe founding teams (Beckman, 2006), for example, start-up team (e.g. Franke et al., 2008), and new venture team (Klotz et al., 2014), we use the term '*founding team*' in this paper. The founding team encapsulates ownership of equity, autonomy of decision making, and entitativity (Knight, Greer, & De Jong, 2020). In line with this, we use the term '*co-founder exit*', also called entrepreneurial team member exit (Gregori & Parastuty, 2021), to describe the process in which one or more co-founders leave a founding team as an important subset of entrepreneurial exits e.g. the venture might still exist after a co-founder has exited (Gregori & Parastuty, 2021; Piva & Rossi-Lamastra, 2017). Given this focus and the associated challenges to current understanding outlined in the introduction there are three streams of literature that are particularly relevant to this study.

4.1.1 Entrepreneurial Affect

Affect—an individual's feelings and emotions—influences significant aspects of the entrepreneurial process (Baron, 2008; Cardon et al., 2012). This is especially so in founding teams (Baron, 2008), where positive affect may reduce conflict between co-founders (e.g. Baron, 2008; Barsade, 2002). Through social interactions, teams create a collective level affective response that is called shared affect (Barsade & Gibson, 2012 p.119). Shared affect is an essential aspect of group dynamics (Barsade & Gibson, 1998; Kelly & Barsade, 2001; Knight & Eisenkraft, 2015). This is because teams that are affectively similar experience fewer negative emotions (Kaplan, Laport, & Waller, 2012), whereas low levels of shared affect adversely impacts group effectiveness (Barsade & Gibson, 2012). Overall, low levels of shared affect can lead to enhanced conflict and less cooperation (Barsade et al., 2000).

Within the context of founding teams, recent research has found that affective diversity (passion diversity in this case) is negatively related to performance in a study of 107 teams (Mol et al., 2020). Hence, it seems surprising that this lens of shared affect has not been applied to co-founder exits, given that we know that exiting a venture is a highly affective process (Shepherd, 2003). Specifically, literature has largely neglected investigation into how dynamic changes in shared affect play out across teams experiencing a co-founder exit (Gorgievski & Stephan, 2016), and how high or low levels of shared affect impact both the co-founders who leave and those who remain. Thus, while existing literature has shown how important interactions are within founding teams in influencing performance (Ensley & Hmieleski, 2005; Klotz et al., 2014), the affective antecedents that impact interactions within a founding team remain ambiguous.

4.1.2 Shared cognition

Shared cognition, the collective beliefs and perceptions within teams (Knockaert,

Foss, & Leunbach, 2016) reflects 'an agreement [among team members] as to what is being understood' (Thompson & Fine, 1999, p. 280). It is strongly related to venture outcomes (Ensley & Pearce, 2001) and firm performance (West, 2007). Within wider team process research, low levels of shared cognition—specifically conflict perceptions—has been found to decrease performance and creativity in groups (e.g. Jehn, Thatcher, & Rispens, 2010). Thus, while shared cognition stems from individual members, it is important to look at it in the context of teams as it manifests as a collective phenomenon (Marks et al., 2002).

Despite the team focus, attention to shared cognition at the founding team level is surprisingly uncommon in entrepreneurship research (West, 2007), especially in the context of its impact on entrepreneurial exits. Here, there is little discussion of how differences in levels of shared cognition within founding teams impact team conflict levels, exit speed, and resulting outcomes following a co-founder exit (Knockaert et al., 2016). Hence, differences in levels of shared cognition could explain the mixed empirical results about co-founder exits to date (Chen, Chang, & Chang, 2017). This lack of knowledge about shared cognition is reflected in a recent call for research, in which shared cognition in founding teams is identified as "an important domain to explore, e.g. how and under which conditions it emerges and influences various outcomes" like co-founder exits (Knockaert et al., 2016 p.315).

4.1.3 Entrepreneurial exits

Finally, entrepreneurial exit research has typically covered entrepreneurial exit intentions (DeTienne, 2010; DeTienne & Cardon, 2012), the strategies and process of exit (Åstebro & Winter, 2012; Ryan & Power, 2012) and more recently the impact of entrepreneurial exit on an entrepreneur's mental health (Hessels et al., 2018). While this scholarship has contributed significantly to the understanding of entrepreneurial exits, the majority of the studies focus on the exit of individual entrepreneurs from self-employment (cf. Wennberg et al., 2010; Hessels et al., 2018). Although, one important study investigates exits from a team perspective by exploring *how* interaction processes can trigger an exit event (Breugst et al., 2015). Breugst et al. (2015) find that external threats can trigger an exit, but do not further investigate how the internal dynamics of low shared affect and cognition could impact the overall team process and consequences following a co-founder exit. As such, there is a disconnect between theorising in team processes and entrepreneurial exits, with the potential to resolve several contradicting findings in this context. Specifically, there is a need to integrate concepts from team process literature to explore the internal, underlying mechanisms of a team's social interactions that lead to co-founder exit (e.g. Gregori & Parastuty, 2021; Patzelt et al., 2020). Given this, our study aims to advance understanding of how dynamic affective and cognitive processes impact founder exit.

4.2 DATA AND METHODS

Knowledge of the affective and cognitive nature of entrepreneurial exits in the team context is scarce (Gregori & Parastuty, 2021). Yet, understanding such temporal issues affecting founding teams is essential (Lockett et al., 2006). We ground our theorizing in data to inductively establish what is important (Edmondson & Mcmanus, 2007) and utilize a multiple case study approach to explore the 'how' and 'why' of co-founder exits. This approach enables a highly iterative research approach that is tightly linked to data and appropriate in unexplored research areas (Eisenhardt, 1989). To understand the temporal, affective and cognitive dynamics at play leading up to, and following co-founder exits, we employed a longitudinal design. That is, we followed teams up to 20 months; all of them experienced a co-founder exit at some point in this period. This enabled us to understand the contextual events that changed over time (Van de Ven, 2007) and aided us in developing a deeper understanding of the causal mechanisms at play within the co-founder exit process.

4.2.1 Case selection

We utilized a multiple-phase theoretical sampling approach (Miles & Huberman, 1984). We did this to deviate from the dichotomous view frequently adopted in entrepreneurship exit research that views staying in a venture as positive, and leaving as negative (DeTienne, 2010). As such we delimited our sample to only select teams that featured a co-founder exit. By doing this we could focus more on our research question of how do varying levels of shared cognition and affect shape a co-founders exit, and focus less on the dichotomy of trying to predict if a co-founders exit is positive or negative. Hence, theoretical sampling was suitable here given our exclusive focus on co-founder exits, as it enabled us to select cases that would offer theoretical insights (Miles & Huberman, 1984). Hence, by delimiting our sampling to teams that featured an exit, we could compare the outcomes of the co-founders exit across all teams in our sample. As we were not able to predict which teams would experience a co-founder exit, we engaged in purposive sampling (Miles & Huberman, 1984) in our first phase of data collection. We did this by specifically focusing on ventures founded and run by a founding team (Cooney, 2005). In addition to dyadic teams, we included teams with three or more members in our study to strengthen the generalizability of our results (for case demographics and details see appendix A). We identified a need to follow early-stage ventures across both the venture inception and venture development phase (Wang & Singh, 2014), given that mature organisations are no longer entrepreneurial ventures (Patzelt et al., 2020), we wanted to investigate a co-founders exit from an entrepreneurial venture, not from an established business which would appear in the later stages. Hence, our research focused on founding teams situated in incubators and accelerators in Denmark. Incubators are increasingly important for founding teams (Siegel et al., 2007), as teams in these settings are highly relevant because they are likely to still be run by their founding team, and likely to be in the early stages of the venture life cycle. We

identified two incubators and two accelerators located at or around the lead author's university.

4.2.2 Data Collection

We identified and contacted 130 start-ups, first by email and then either face to face or by phone. Following initial contact, 29 teams that fit our criteria agreed to participate in our study. Of the 29 teams we followed, 11 teams experienced a co-founder exit. After we identified which teams experienced a co-founder exit, we utilized a theoretical sampling approach in phase two of data collection. In this phase, we engaged in follow-up interviews. Two of the 11 teams did not permit follow-up interviews and were subsequently dropped from our study; nine teams remain in our study. Our final sample consisted of six dyadic teams, and three teams with three or more people. While other similar studies limit their sample to two-person teams due to the complexity of interactions in teams with more than two people (cf. Breugst et al., 2015), we realized throughout our data analysis that teams with three or more people were also incredibly information-rich (Patton, 2002) and allowed for a deeper understanding of the phenomenon of interest. Consistent with the approach of inductive research, we combined multiple data collection methods over two stages (Eisenhardt, 1989). We collected three types of data: observation, secondary and interview data.

4.2.3 Observation Data

First, to understand the level of shared affect and cognition *before* a co-founder exit, we conducted full team observation sessions for 1.5 hours. In these sessions, the teams discussed their performance and venture generally, and then discussed issues impacting the team. Throughout this session, we utilized Shimmer3 GSR+ Unit sensor's to monitor changes in activation levels (Lei, Sala, & Jasra, 2017) and utilised video recordings to later analyse the affective data throughout the interactions (cf. Thomas, Lomberg, & Cash, 2020). After the observation session, every member of the team completed a short survey about team conflict (Jehn, 1995), cohesion (Bollen & Hoyle, 1990), and venture details. This first phase of data collection complemented traditional interview and survey data as we could directly measure affective dynamics between whole founding teams, without relying on asking them to tell us their perception of the team's dynamics, which may be affected by hindsight bias following a co-founder exit (Fischhoff, 1975).

4.2.4 Interview Data

We conducted follow-up conversations every six months with the teams to understand any changes in venture membership. All correspondence was recorded and transcribed. If a co-founder had exited the venture, we arranged a follow-up semi-structured interview with the remaining co-founder(s) and the co-founder that left. Following our theoretical sampling approach (Miles & Huberman, 1984), in some instances, we interviewed the leaving or remaining co-founder(s) multiple

times to ask relevant follow-up questions as the data analysis and data collection progressed iteratively. In line with best practice in exploratory research (Molina-Azorín et al., 2012) we utilised a semi-structured interview guide. The interviews following a co-founder exit centred around three major themes: (i) the co-founder exit process, (ii) the impact of the exit, and (iii) the co-founder relationships. All interviews took place on video conferencing software due to public health guidelines prohibiting face to face meetings at the time of data collection. To enhance the transparency of answers we promised that all data shared with the researchers would remain both confidential and anonymous. Notably, we did not share responses between co-founders who left and co-founders who remained. All interviews were recorded and transcribed verbatim, the average duration was between 30 to 40 minutes.

4.2.5 Secondary Data

Finally, we followed all teams on LinkedIn, tracked their website and viewed their official tax and venture records regularly and noted any significant changes in the teams, like obtaining funding, employing new staff, or a co-founder exit. We stored all supporting additional data, notes and all email exchanges in respective case files.

4.2.6 Data Analysis

Utilising case study methodology (Yin, 2002), we developed robust and detailed profiles for each new venture team. Each case consisted of a timeline of the venture, detailed biometric and affective analysis and detailed qualitative analysis. Throughout data analysis, we focused on the dynamics within the founding teams, and we utilised the quantitative data to complement the validity of our findings (Yin, 2009).

4.2.7 Shared Affect

To calculate shared affect, we first performed facial expression analysis on each participant, using the facial expression analysis Affectiva AFFDEX algorithm on iMotions (2019). This produced a continuous valence score from negative-positive for each participant throughout their interaction. Second, we analysed each respondent's physiological data using biometric measurements to ascertain when a participant experience a physiological 'peak' (Benedek & Kaernbach, 2010). Third, we triangulated each participant's affective data and physiological data using MATLAB (Matlab, 2019) to get a metric for how many "positive peaks" and "negative peaks" each participant experienced throughout their interaction. Fourth, we then compared the ratios of activated positive to negative peaks within teams, categorising teams with similar ratios as high in shared affect, and teams with significantly different ratios as low in shared affect (High $= \leq 1.5$ peaks different, Low $= \geq 1.5$ peaks different). Team 5 is an example of a team with high shared affect: Richard had 1.8 positive peaks: 1 negative peak and Nathan

had 1.4 positive peaks: 1 negative peak. Team 9 is an example of a team with low shared affect: Ian had 10.75 positive peaks:1 negative peak, whereas Ed had 1.4 positive peaks: 1 negative peak

4.2.8 Shared cognition

First, we measured shared cognition by calculating the standard deviation within founding teams across two scales: (A) Jehn's (1995) conflict scale and (B) Bollen and Hoyle's (1990) team cohesion scale. The higher the shared cognition, the smaller the standard deviation (Jehn et al., 2010). Shared cognition varied from 0 - 1.09 (mean = 0.42) for relationship conflict, 0.18 – 0.88 (mean = 0.59) for task conflict, and 0.28 – 1.21 (mean = 0.83) for team cohesion. We classified teams with standard deviations above the sample mean standard deviation as low shared cognition (see appendix B). Second, to evaluate shared perceptions of justice (a component of shared cognition; Colquitt, Noe, & Jackson, 2002) we qualitatively evaluated each person's perception of justice as high or low and compared statements from team interactions and follow-up interviews (Breugst et al., 2015). We categorise teams as low on this variable if one member perceived justice as high and the other as low, or high if both members perceived the justice as low or high.

4.2.9 Qualitative Analysis

First, we transcribed all recorded data ready for analysis. One recording was in Danish, this was translated into English and checked for accuracy. Second, we followed inductive, open-coding procedures to develop first-order codes (Gioia, Corley, & Hamilton, 2013). Third, we moved to axial coding to develop second-order coding (Corbin & Strauss, 1990). Given we had coded all data streams, we integrated all first and second-order codes from all types of data into higher-order themes. We iteratively revised the coding scheme, looking through data and repeating coding analysis cyclically before finalizing our data structure (Miles & Huberman, 1984). Fourth, for each core thematic finding, we constructed tables with all relevant data and compared the data across cases. Fifth, we performed an in-depth case comparison, we alternated between our data tables, data structure, and higher-order constructs. In our model (figure one), important variables and relationships became evident.

4.3 FINDINGS: SHARED AFFECT, SHARED COGNITION, INTERACTION SPIRALS AND RELATIONAL OUTCOMES

While this was an inductive study, we feature our model here to highlight the key constructs and relationships that emerged from our data. Central to our proposed model is that varying levels of shared affect and cognition within a team *prior* to a trigger event causes different types of team interaction spirals, subsequent co-founder exits, and has a knock-on impact on the exiting co-founders and remaining team. Specifically, the preconditions cause different types of vulnera-

bilities in the team to trigger events, once the trigger event occurs, teams react in different ways by experiencing interaction spirals which can cause conflict and reduced commitment to spiral, and these reactions cause varying relationship outcomes. The major elements of the model are outlined in Figure 1 and explored in the following sections.
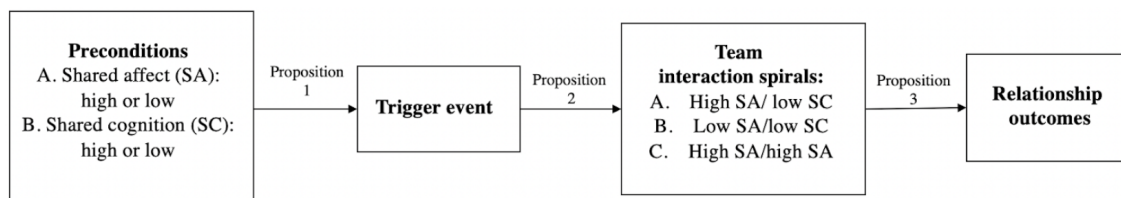
Figure 1: The impact of shared affect and cognition on team interactions and outcomes in the exit process. Shared affect and cognition create vulnerabilities to trigger events, which cause different team interaction spirals and result in various relationship outcomes.

4.3.1 The level of shared affect and cognition set the stage for a trigger event

The nine teams were categorised across four preconditions determined by levels of shared affect and cognition (Table 1). One team had high shared affect, but low shared cognition, four teams had both high shared affect and high shared cognition, and four teams had both low shared affect and low shared cognition. Teams with high shared affect had a relatively balanced frequency of positive affective displays, like smiling and laughing, to negative affective displays, like frowning or scowling. Teams with a low level of shared affect had a relatively imbalanced frequency of affective displays, with members showing a very different ratio of positive to negative affect throughout team interactions. During some team interactions, members would display opposing affect, with one member emoting activated negative affect (like anger) and the other emoting activated positive affect (like joy). We found that when a founding team experienced a 'trigger event', an event which triggered a co-founder exit decision, their resulting behaviour and venture outcomes differed significantly depending on these affective and cognitive preconditions.

Level of shared affect	Level of shared cognition	Event that triggered exit	Team
High	Low	External lawsuit	3
High	High	Pivot - product	5
High	High	Pivot - market	1
High	High	Pivot - product	6
High	High	Pivot - market	4
Low	Low	Conflict - performance	2
Low	Low	Conflict - incorporation	7
Low	Low	Conflict - equity split	8
Low	Low	Conflict - direction	9

Table 1: The three categories of shared affect and cognition when resulted in different vulnerabilities that were triggered by specific events

For example, one team that had high shared affect and low shared cognition was able to emotional support each other because of their shared affect, yet, they disagreed cognitively about how to proceed in the venture. Even with low shared cognition, they had overcome multiple prior challenges. Yet, this low shared cognition created a vulnerability in the venture as the founders frequently had differing opinions about how to overcome challenges. Over time, this vulnerability created weakness within the team. Eventually when they were faced with their biggest existential threat—a $3,000,000 lawsuit against the company—one founder, Matthew, who dissented about how to handle the issue decided to leave. This was despite being aligned emotionally with his co-founders. Mark, a co-founder who remained in the venture summed this up when he said:

"We were a company in a conflict, and that seems to also exacerbate things in a team, so I think it's especially because Matthew was of course pushing hard for some aggressive measures, for something to be done. I think we were seeing the problem in different ways, at least I was probably on the other side [to Matthew] in terms of just trying to relax things and trying to see you know hold on that it should be managed in a different way. So I think there was definitely some tension in terms of our perspectives."
– Mark, Team 3

This quote exemplifies how the difference of opinion between the co-founders in Team 3 became more significant when the threat became insurmountable without shared cognition. This emphasises how the preconditions of high shared affect and low shared cognition makes teams vulnerable to existential trigger events that require cognitive consensus about strategy and direction.

We compare this to teams that had both high shared affect and high shared cognition. These founders were aligned emotionally and cognitively, hence, they could agree on strategies and were able to discuss their emotions. They were comfortable in the team, often being close friends with their co-founder(s). Yet,

this meant that when they were faced with a real challenge, like a significant market or product pivot, their high levels of comfort prompted feelings of apathy and made them look outside of the venture for a new opportunity. For example, one co-founder in this category noted that:

"It happened so naturally, I guess because we didn't have very big hopes on it. So it was more yeah what happens, happens. Will just go with the flow and we just decided mentally okay it's not worth wasting time on this when we had to pivot to the American market. Well not wasting time on it by putting our hours into it." – Wayne, Team 6

This quote highlights how the antecedent conditions of high shared affect and high shared cognition can make founders comfortable in their team and their venture, yet this comfort can make them vulnerable to apathy, especially in the face of setbacks and challenges associated with pivoting the venture. This vulnerability can eventually lead the co-founder to perceive a new opportunity outside of the venture, hence when confronted with a real challenge, they exit.

Finally, teams that experienced both low shared affect and low shared cognition were vulnerable to a wide range of events early in the venture. Here, unlike a major lawsuit or pivot prompting an exit, founders in this category were triggered due to lack of cognitive agreement, or the lack of emotional support between the founding team. This resulted in conflict about a wide range of topics, eventually triggering an exit. Jenny from team two exemplified this when she said:

"I think in August, I don't remember the exact thing that pushed me over my limit, but I realised if we didn't do something serious about how we cooperated I didn't want to continue. And I also realised that asking this [to have a better relationship] might result in the death of the start-up. And that was actually what happened." – Jenny, Team 2

This quote highlights how the antecedent conditions of low shared affect and low shared cognition makes founders vulnerable to a large range of challenges in their venture. However rather than a consistent pattern of trigger events in teams in this category, as Jenny said, there was often not one exact event that triggered founders to leave. Rather, it was a consistent level of friction and conflict arising from an inability to see eye to eye on tasks or understand each other emotionally.

Taken together, teams from each of these three shared affect and cognition categories (Table 1) developed distinct preconditional vulnerabilities. This meant each team was vulnerable to different trigger events, like facing an existential threat which required consensus, or dealing with emotional conflict which required shared affect. Thus, we propose that different preconditional levels of shared affect and cognition have a specific impact on which events will trigger an exit process, encapsulated in proposition 1A-C.

Proposition 1A. Teams with high shared affect and low shared cognition are vulnerable to trigger events of an existential nature, events that require cognitive consensus to resolve

Proposition 1B. Teams with high shared affect and high shared cognition are vulnerable to feeling apathetic about the venture, and when experience an event that would require a high level of energy, this can trigger an exit

Proposition 1C. Teams with low shared affect and low shared cognition are vulnerable to a wide range of events that require consensus or emotional understanding, such as equity splits, incorporation, or future directions

4.3.2 Preconditions and trigger events change how teams interact

Further to the trigger event vulnerabilities created by the preconditional levels of shared affect and cognition, subsequent team processes also followed three distinctive 'interaction spirals'. These interaction spirals impacted how, when, and why co-founders exited their venture. For example, in Team 3, the high levels of shared affect meant that all co-founders expressed similar levels of negative affect like stress and upset caused by the lawsuit—yet because of their low levels of shared cognition, they disagreed on the steps needed to take to solve the issue over time. Consequently, conflict levels increased as they regularly disagreed about the best approach. This in turn exacerbated their shared negative affect, i.e. the whole team became progressively more stressed and negative, and consequently, further reduced their shared cognition. Yet, their high shared affect meant that even in the face of this *"horrendous experience"* (Matthew, Team 3), the co-founders experienced a strong underlying bond, forged through shared affective experiences. He summed this up in a follow-up email after leaving:

"We can still rely on each other a lot when it comes down to it and if needed we would probably do just about anything to help each other as there is still a strong underlying bond." – Matthew, Team 3

The high shared affect meant that even though Matthew felt *"absolutely sick and tired"* of the situation, he prioritised action that would mitigate the negative impact of leaving on his co-founders. He slowly transitioned to the board role (where he still serves 20 months later) and remains highly committed to the venture. While the trigger event did exacerbate preconditions, specifically, the stress of the lawsuit further exacerbated their low shared cognition and increased conflict levels, their high shared affect meant that he remained committed to the venture and this ultimately mitigated much of the impact of his exit. Hence, in this interaction spiral increased conflict levels led to an extended time to exit and over the long run increased Matthew's commitment to the venture, resulting in him remaining involved with the board.

Second, we use Team 5 to illustrate the high shared affect and high shared cognition interaction spiral. In Team 5, the high levels of shared affect meant that the co-founders expressed similar levels of positive affect, like joy and camaraderie

throughout their usual interactions. They also agreed on the direction to take the business, which in turn led to more positive affect as they worked well together, hence conflict levels never increased and their interactions spiralled between positive affect and shared cognition. Yet, when they experienced two trigger events concurrently, doing a market pivot and securing additional investment, Nathan faced apathy and lost motivation for the venture. Due to the teams high shared affect and cognition interaction spiral, Nathan decided he would take action and exit to avoid damaging their relationship:

"My co-founders' father is currently doing an investment in the company, and it's a rather large investment so, if I was to be in the company and then he if he would invest, and then my doubts would make me leave. I would rather do it now than do it later and damage our relationship." – Nathan, Team 5

Even after Nathan decided to leave, the spiral between shared positive affect and shared cognition meant that his relationship with Richard remained strong, and Nathan decided to transition very slowly. He remained working full time for nine months, while his co-founder found a replacement. Hence, throughout their interaction spiral high shared cognition led to a low level of conflict and high shared affect resulted in a slow exit speed with a high level of commitment to the venture. The high shared affect and cognition in these teams meant that regardless of the trigger event, the impact of the exit on the venture was mostly mitigated.

Finally, we use Team 9 to illustrate the low shared affect and low shared cognition interaction spiral. In Team 9, the low levels of shared affect meant that the co-founders expressed different types of affect throughout their interactions (e.g. Ian emoted a lot of positive affect, while Ed emoted significant negative affect), and due to their low levels of shared cognition they not only disagreed about the strategy for their business but also struggled to communicate and fix the interpersonal issues. This created a feedback loop where each subsequent interaction further reduced shared cognition and increased negative affect. This low affect and cognition spiral meant that over time their conflict levels increased, while their alignment in strategy and affect decreased. Ed detailed this spiral when he said:

"So we were working together from 2017 to 2020, there were a lot of things well... if you have a partner that can't, or that doesn't listen or doesn't evolve with the business, I think that you accumulate some annoyances over that cannot be fixed. Especially if you have a partner that doesn't want to change"

Hence over time, their interaction spiral led to less shared affect and less shared cognition. Ed shared how they attempted to talk rationally but would often end up shouting at each other, unable to see each other's point of view:

"I had some issues but I didn't think he wanted to change. We talked about things...

like how I felt, and… how we differed… Pretty much after that he was like 'yeah I don't know why you keep saying that the situation that is like this you just need to push through it, and work it out and work towards the goal that we have'. And I was like yeah, no. That's not how it works."

In their interaction spiral, this low shared cognition led to a rapid increase in conflict, and due to their low shared affect, Ed (*leaver*) felt his only option was to abruptly exit. He said, *"I told Ian [his co-founder] that I didn't want to focus on the business any more. It ended abruptly. But it was at the point where I would've even gone insane, so I did what I did."* The lack of shared affect experienced by Ed meant that he did not feel valued or listened by Ian. Due to the steady increase in conflict between the founders, Ed's commitment to the venture steadily decreased resulting in an accelerated, rapid exit.

Taken together, the preconditions of shared affect and cognition created certain vulnerabilities that when triggered through an event lead to distinctive interaction spirals. These spirals were amplifying loops, where affective and cognition homogeneity or heterogeneity were amplified over time, resulting in changes in conflict level, commitment, and exit speeds. Thus, we propose that different interaction spirals starting with high or low shared affect and cognition impact team conflict, and how co-founders exit their venture, encapsulated in propositions 2A-C.

Proposition 2A. High shared affect and low shared cognition interaction spirals increase conflict, extend the time to exit and increase a co-founder's commitment to the venture

Proposition 2B. High shared affect and high shared cognition interaction spirals decrease conflict, decrease time to exit and increase a co-founder's commitment to the venture

Proposition 2C. Low shared affect and low shared cognition interaction spirals increase conflict, increase time to exit and decrease a co-founder's commitment to the venture

4.3.3 Different interaction spirals caused varying relationship outcomes

Finally, depending on the reactions of the founding teams throughout the different interaction spirals, a co-founders exit caused different relationship outcomes. Namely, the relationship between the exiting co-founder and the remaining co-founder(s), the internal relationships between the remaining co-founders, and the external relationships with remaining external stakeholders all differed according to what interaction spiral the founding team had entered in to.

For example, in Team 3, the buffering effect of sharing negative emotions like stress and grief in the high shared affect low shared cognition spiral, meant that the relationships between the exiting co-founder and remaining co-founders were not negatively impacted throughout the co-founder exit process. The relation-

ships between the remaining co-founders improved, however the relationships with the external stakeholders remained the same. For example, while the team did experience low shared cognition which spiralled with the shared negative affect, the strong affective bonds within the team meant that even after Matthew left, the co-founders remained close. Namely, in a follow-up interview 12 months after leaving Matthew said, *"It still feels like they are family members"*. Mark said, *"We still have a good professional relationship"*. Hence, even though both parties experienced spiralling shared negative affect and low shared cognition which increased conflict, their relationship did not deteriorate. Yet, the relationships between co-founders who remained after Matthew had left improved markedly. After Matthew exited, shared cognition increased and Mark reported the relationship between the remaining members had *"actually improved dramatically. I feel like it's actually a better situation than it was before Matthew left."* As Matthew had been the main source of low shared cognition, when he left the spiral stopped amplifying low shared cognition. Mark summed this up: "(Matthew leaving) *alleviated some stress or pressure in terms of the disagreements about everyday operations of the company. A lot of these things that were stress factors have been mitigated."* Finally, the relationship with the venture's external stakeholders (in this case investors), was somewhat damaged by Matthew's exit. Matthew summarised this when he said:

"I think as I said that was probably the thing that we discussed most which was how we were gonna communicate the fact that I was leaving. So we went out for coffee with the investors and just let them know I think they were a bit disappointed and pissed off...."

Taken together, Team 3 had preconditions of high shared affect and low shared cognition which created a vulnerability to trigger events of an existential nature that required consensus. Hence, when the external lawsuit occurred, over time the interactions in the spiral amplified the low shared cognition which increased conflict and magnified the shared negative affect experienced in the team. However, when Matthew exited, the interaction spiral was halted and the interactions between the remaining co-founders stopped amplifying low shared cognition, hence their conflict reduced and relationship improved. Nevertheless, the strong affective bonds built through high shared affect between Matthew and his former co-founders buffered the relationships against damage and resulted in improved relationships with remaining co-founders.

We use Team 5 to exemplify the relationship outcomes of the high shared affect and high shared cognition interaction spiral. In Team 5 the high shared affect meant that when Nathan decided to leave the venture, there was a high level of understanding fostered between the co-founders due to their shared affect. As their shared cognition remained high throughout Nathan's exit journey, the conflict never escalated and they agreed the tasks they needed to do to ensure the business would continue. This impacted the relational outcomes. For example, Nathan reported their relationship remained with his co-founder strong after he

left. He said, *"Personally, I think this might be good for our friendship as well... until now, nothing has changed friendship wise."* Although their relationship remained strong throughout the exit process, Richard (the remaining co-founder) aimed to improve the relationships with other employees in the venture. He started to focus on fostering high shared affect and cognition with others in the venture. He did this to make the venture comfortable again, as it was throughout the high shared affect high shared cognition interaction spiral prior to Nathan's exit. In a follow-up interview, Richard said:

"[I started focusing on] my relationships to them, making sure that they are going to stay in the company if they are fulfilled by that. I have more meetings about personal goals and how people are feeling and what they think they are interested in, what they're working with, and if I can do something better and how is my relationship to them and their relationship to the other people?"

For teams that experienced this interaction spiral, the relationship with remaining external stakeholders remained the same after the co-founder exit. Team 5's external stakeholders did not perceive Nathan was leaving due to a breakdown in relationship or low shared cognition, which may have caused them to lose faith in the founding team. Rather, they were initially shocked but then understood Nathan was leaving to pursue a different career. They trusted Richard to handle the business. Richard explained this when he said:

"I wondered how to tell everybody that is a stakeholder or close to the company? How do we sell this? Yeah, some people were shocked and they took it very seriously. I told them what was going to happen now, and how we were going to turn this into a better company now. And then everybody was convinced that this was manageable, that it's all OK, and we moved forward."

Hence, in Team 5 (and in other teams with the preconditions of high shared affect and high shared cognition) the co-founders were vulnerable to feeling apathetic about the venture, and when Team 5 experienced a market pivot and an increase in funding, Nathan realised how apathetic he felt which triggered him to exit. The interaction spiral Team 5 experienced amplified the high shared affect and high shared cognition which did not increase conflict and enabled Nathan and Richard to work together to set the venture up to progress after Nathan had left. Unlike in Team 3, where the interaction spiral halted after Matthew's exit, the high shared affect and high shared cognition interaction spiral continued even after Nathan exited the venture, as Nathan and Richard remained friends. Hence, the affective bonds developed by high shared affect meant that their relationship withstood an exit, the relationships with existing venture members improved, and the relationships with external stakeholders remained the same.

Finally, for teams that entered into a low shared affect low shared cognition interaction spiral the increased friction, conflict and decrease in ability to agree or engage together throughout their interaction spiral caused specific relationship

outcomes. We illustrate this with Team 9 and Team 7, as Team 9 consisted of only two members so Team 7 illustrates the impact of this interaction spiral on remaining members. The low shared affect meant that over time there was a complete breakdown in the co-founders' relationship, and considering the inability to discuss strategy and details about the venture because of their low shared cognition, the relationship came to a bitter end. For example, in a follow-up interview after leaving, Ed (leaver, Team 9) said:

"I think that it was pretty much like the four horsemen of the apocalypse kind of type thing [contempt, stonewalling, criticism and defensiveness]... I'm certain we won't be friends again. We did try to talk it out, I guess without becoming angry at each other, but for me at least, and I think for him also, we are not going to be friends again."

In Team 7, a team that also experienced the low shared affect and cognition interaction spiral, Eva (leaver, Team 7) also described this complete breakdown of the relationship with her former co-founders after she left:

"I thought we were really friends, not just people who are starting a company together... So I was like how you don't care about our friendship? It doesn't matter now? You just threw that away."

While the relationships between the exiting and remaining co-founders ended badly in both Team 9 and Team 7, the relationships between the co-founders who remained improved in Team 7. For example, Francesco, a remaining co-founder from Team 7, described how the remaining co-founders experienced an increase in shared affect and cognition as a direct result of Eva leaving: *"maybe the fact that you can both be annoyed with other people in your company kind of does bond you and bring it together in a weird way"*. As was the case in Team 3, when Eva exited the venture the low shared affect low shared cognition interaction spiral was halted. The interactions stopped amplifying low shared affect and cognition, which in turn improved the remaining relationships. For example, Francesco described how after Eva left, their relationships improved as the level of shared cognition increased, *"we could focus [more], there was a lot less conflict, we agree on almost everything."* Nevertheless, the low shared affect and cognition interaction spiral caused deleterious consequences on the relationships with external stakeholders, resulting in a significant decline. Team 9 illustrates this. Ian shared that after Ed left (Team 9), Ed hastily contacted all their clients: *"Overnight, he contacted all our clients, the clients we had been building for over a year, and said we had closed down. He told everyone close to the business that we were over."* Resulting from the conflict that was amplified through the lack of shared affect and cognition in this interaction spiral, Ed neither considered nor cared about maintaining a relationship with Ian or the external stakeholders. Ed described how *"It was a fight or flight question for me I think. I just wanted to say to myself I'm moving forward, I'm closing this chapter of my life, so I didn't want to have anything to do with it I just wanted to say I'm out."* Hence, the preconditions of low shared affect and cognition played out in their interaction spiral, and ultimately negatively

influenced the relationships with external stakeholders for these teams.

Hence, in Team 9 (and in other teams with the preconditions of low shared affect and low shared cognition) the co-founders were vulnerable to a wide range of events that require consensus or emotional understanding. A range of events such as equity splits, incorporation or strategy meetings could trigger a co-founder to exit. In Team 9, Ed realised how much conflict and friction was being amplified through their interactions, and due to their lack of shared affect or cognition, they could not work together to repair their relationship, or the relationship with external stakeholders. Hence, low shared affect and cognition meant that the co-founder relationships could not withstand the friction caused through their interaction spiral, or the stress of the exit. However, the relationships between the remaining co-founders improved in Team 7, and in all teams in this category following an exit. Overall, teams that experienced low shared affect and cognition experienced a decline in their relationships with external stakeholders.

Taken together, the preconditions of shared affect and cognition played out in interaction spirals that led to distinctive exit behaviours that impacted the relationship outcomes for both leavers and remainers. We highlight that when a co-founder exits their venture, the exit concludes the interaction spiral in cases with low shared cognition. Yet, this was not the case with teams who experienced a high shared affect, high shared cognition interaction spiral, as they continued to share affect and cognition even after the co-founder exited.

Proposition 3A. A high shared affect, low shared cognition interaction spiral will not negatively impact the relationship between the exiting and remaining co-founders, it will improve the relationships between remaining co-founders, and will result in worsened external stakeholder relationships

Proposition 3B. A high shared affect, high shared cognition interaction spiral will not negatively impact the relationship between the exiting and remaining co-founders, it will improve the relationships between remaining co-founders, and will result in unchanged external stakeholder relationships

Proposition 3C. A low shared affect, low shared cognition interaction spiral will negatively impact the relationship between the exiting and remaining co-founders, it will improve the relationships between remaining co-founders, and will result in worsened external stakeholder relationships

4.4 DISCUSSION AND IMPLICATIONS

The affective and cognitive processes that shape team social interactions are an important underlying mechanism in the co-founder exit process (Patzelt et al., 2020). Yet, prior literature has not integrated these concepts into entrepreneurship research, and as such, we lack a comprehensive understanding of how team processes shape the co-founder exit process. Taking this as a starting point, we asked "*In what ways do affective and cognitive processes in team interactions lead to co-founder exits, and how and why do the relationship outcomes of these exits*

differ between founding teams?" We find that not all co-founder exits are equal; specifically, the level of shared affect and cognition form important preconditions that create certain vulnerabilities to events which can trigger a co-founder exit. Subsequent to that, the preconditions of shared affect and cognition change the interactions throughout the co-founder exit process which leads to an amplifying spiral that exacerbates either high or low shared affect and cognition, this leads to a range of subsequent venture and relational outcomes. These findings form the basis of our contributions to theory on entrepreneurial exits, entrepreneurial affect, and shared cognition.

4.4.1 Theoretical and practical implications

First, we make an empirical contribution to the field of *entrepreneurial exits*. We illustrate how to utilise dynamic, affective data at the team level to investigate how patterns in shared affect and cognition impact co-founder exits. Namely, by using facial expression analysis and biometric data, we harness micro-level data to study shared affect in founding teams with increased objectivity for the first time. This is important when considering that prior work calls for the use of micro-level data across different levels of analysis to understand the entrepreneurial process (Patzelt et al., 2020). This is also significant for prior work that has applied the affective lens to entrepreneurial exits. Important prior work has investigated affective experiences like grief (Shepherd et al., 2009) and relief (Jenkins, 2021) in lone entrepreneurial exits, yet by looking at the affective experiences at the team level (e.g. affective heterogeneity) some of the contradictory results in entrepreneurial exit theory to date can be explained. For example, not all teams experience resource loss after a co-founder exit (Chandler et al., 2005) because some teams remain in close contact following a co-founder exit due to high shared affect and continue to share resources, whereas other teams do experience resource loss due to the affective dynamics at play throughout the co-founder exit process (e.g. the co-founder wants to immediately terminate contact with the venture). Hence, by contributing novel empirical approaches, we have developed a more nuanced theory on the impact of co-founder exits.

Second, we make two contributions to *entrepreneurial affect* literature. For the first time, we identify the level of shared affect as a key variable in co-founder exits. We highlight how the variation in shared affect is an important precondition that influences how co-founders interact and shapes how and when co-founders exit their venture. This reflects a major step forwards in entrepreneurial exit theory, which has previously focused mostly on the individual level and negative affect (Hessels et al., 2018; Shepherd et al., 2009; Wennberg et al., 2010). In contrast, we find that differences in shared affect disrupt positive group processes (Barsade et al., 2000; Kaplan et al., 2012). While this is in line with general team process theories that show groups with high levels of shared affect exhibit higher levels of cooperativeness and lower levels of conflict than affectively heterogeneous groups (Barsade, 2000), our work reflects the first demonstration of such effects in the highly uncertain and emotional context of founding teams. Hence,

we highlight that shared affect is as a key predictor variable in determining how detrimental a co-founders exit will be on the relationships within and external to the venture. This insight allows us to resolve contradictions in previous literature. For example, on the one hand prior work has found that negative affect is detrimental for founding teams as it harms social ties (Lucas & Diener, 2003) therefore negative interaction spirals can cause increased conflict and lead to a co-founder exit (Breugst et al., 2015), which can damage the team. Yet on the other hand, other work finds that negative affect can be beneficial for founding teams by reducing group think (Fodor & Pintea, 2017), and pushing out founders who 'do not fit', thereby strengthening the remaining team (Chandler et al., 2005). By introducing shared affect as a key variable we theorise as to why high levels of shared negative affect (like conflict, stress and frustration) do no always lead to a co-founder exit that damages the team. Namely, some teams with high levels of negative affect experience a strong commitment to the venture and sustained friendship, even after an exit (as was the case in Team 3), due to the affective experiences they share within the venture. Whereas other teams with low shared negative affect can go on to experience the abrupt end of the relationship and venture (as was the case in Team 9), due to the disparity in their affective experiences with drives the team apart. Hence, we reframe the contradiction that negative affect is both potentially damaging (Lucas & Diener, 2003), and potentially beneficial (Fodor & Pintea, 2017); we highlight shared affect as a central mechanism that determines the impact of a co-founder exit, not the level of negative affect. Together these contributions highlight the need for future theorising to take into account the dynamics of shared affect in the team context, and allow us to resolve prior contradictions.

Finally, we contribute to the literature on *shared cognition*. We provide evidence that teams with low shared cognition will face challenges when they encounter an event that requires group consensus, which can trigger a co-founder exit. Further, we find that low shared cognition goes on to significantly impact future team interactions throughout the co-founder exit process. While this is in line with prior literature that shows low shared cognition decreases performance (Jehn et al., 2010), we substantially extend prior literature that suggests affect and cognition are secondary to perceived justice (e.g. Breugst et al., 2015). Rather, we propose that shared perceptions of justice within teams is one facet of shared cognition. Hence, we suggest that shared cognition and shared affect interact together as a key mechanism that significantly impacts interaction spirals throughout the co-founder exit process. Namely, the impact of low shared cognition can be further amplified by low shared affect (as was the case in Team 9), or the impact of low shared cognition can be buffered by high shared affect (as was the case in Team 3). Hence while shared perceptions of justice are important in the co-founder exit process (Breugst et al., 2015), the interaction of high or low shared cognition with high or low shared affect really determines how and when a co-founder exits, and the impact of the exit.

Further, we emphasise the entrepreneurial exits are an important, novel context to analyse the impact of shared cognition. We deviate from the view that exits

are based on a degree of rationality and level of analysis (Wennberg & DeTienne, 2014) by providing evidence to show that low shared cognition is a fundamental driver in why some co-founders decide to exit. I.e., after experiencing sustained low shared cognition, conflict can significantly increase as co-founders cannot reach consensus, which can lead to an abrupt exit (Team 9, Team 7). Hence, we suggest shared cognition is a fundamental, key variable in the co-founder exit process, and future research should further investigate this important variable to better understand how team interactions can lead to co-founder exits.

In addition to theoretical implications, we also offer implications for practice. We find that in the instances of co-founder exits that were void of rationality and occurred abruptly, there was a high likelihood of knowledge loss, as the leaving co-founder did not maintain a strong enough relationship to plan and execute a handover period. Given that in our sample, low levels of shared affect and cognition caused the biggest disruption for team performance following an exit, founding teams should be aware of communication tools designed to facilitate affective and cognitive convergence. While this may not stop the co-founder from leaving, it may change the type of exit behaviours and resulting outcomes, and thus enable the team to have a constructive, well thought out exit process, minimizing knowledge loss and the loss of customers and funding.

4.5 LIMITATIONS, FUTURE RESEARCH AND CONCLUSIONS

This study was not without limitations. These limitations apply to all case-based research. Specifically, we were limited by our small sample size, which may limit the generalizability of our model. Future research would enhance our model by testing vital relationships on large-scale data. Further, while we utilised novel methodologies to capture affective dynamics, future research would extend our study by capturing more team interactions, and in a more naturalistic environment. Additionally, future longitudinal research could capture data on a more regular basis, namely weekly, or even daily for a longer period of time to monitor the fluctuations in shared affect and cognition in founding teams. It would be interesting to regularly capture data on teams in more developed ventures who were undertaking an Initial Public Offering, this way researchers could develop a more comprehensive understanding of the range of affective experiences throughout different venture stages when exits are potentially more consequential.

An interesting avenue of future research would be to continue tracking the teams overtime following a co-founder exit. After the remaining founder(s) have recruited a new co-founder, it would be helpful to again analyse the affective dynamics within the new team. Do the existing co-founder(s) affective dynamics change, or do their expressions of positive and negative affect remain similar? It would be pertinent to understand if the same affective dynamics develop over time. Does the new co-founder overtime also feel persistent negative affect, will they also eventually leave? This knowledge is important in developing theory on co-founder exits within the team sphere, and also would have important im-

plications for practice on recruiting a co-founder following an exit. Finally, in this study we did not investigate how the relationship with external stakeholders impacted affective dynamics and thus co-founder exits. A promising topic for future research would be to explore how interaction with the board shape exit intentions, types of exits and entrepreneurial outcomes. Namely, if a co-founder feels hostility or negative affect from the board, how will that impact the speed, timing and impact of an exit?

To conclude, this inductive study utilised novel methodologies to investigate how shared affect and cognition play out within the co-founder exit process. Our results suggest that if shared affect and cognition is low, a co-founder exit can seriously disrupt team functioning and lead to significant relationship breakdowns. Finally, we hope that this study not only introduces a new method for measuring affect within founding teams, but that it adds to the conversation about the role of affect and shared affect throughout the co-founder exit process. We hope to stimulate further research into this important and consequential issue for founding teams.

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Team	Name	Gender	Age Range	Educational Background	Venture Life Cycle (T1)	Venture Life Cycle (T2)	Exit Status
Team1	Peter	Male	35-44	PhD	Venture Development	Venture Development	Remained
	Michael	Male	25-34	Master's Degree			Left
Team2	Jenny	Female	45-54	Master's Degree	Venture Development	Venture Development	Left
	Dave	Male	45-54	Master's Degree			Remained
Team3	Matthew	Male	35-44	PhD	Venture Development	Venture Development	Left
	Mark	Male	25-34	PhD			Remained
	Luke	Male	25-34	PhD			Remained
Team4	David	Male	25-34	Bachelor's Degree	Venture Inception	Venture Inception	Left
	Stephen	Male	25-34	Bachelor's Degree			Left
Team5	Nathan	Male	18-24	Bachelor's Degree	Venture Inception	Venture Development	Left
	Richard	Male	18-24	Bachelor's Degree			Remained
Team6	Wayne	Male	25-34	Master's Degree	Venture Inception	Venture Inception	Left
	Darren	Male	25-34	Master's Degree			Left
Team7	Thomas	Male	18-24	Bachelor's Degree	Venture Inception	Venture Development	Remained
	Jason	Male	18-24	Bachelor's Degree			Left
	Eva	Female	18-24	Bachelor's Degree			Left
	Francesco	Male	18-24	Bachelor's Degree			Remained
Team8	Max	Male	35-44	Bachelor's Degree	Venture Inception	Venture Inception	Remained
	Micah	Male	25-34	Bachelor's Degree			Remained
	Andrew	Male	35-44	Bachelor's Degree			Remained
	Sam	Male	35-44	Bachelor's Degree			Left
	Sean	Male	25-34	Bachelor's Degree			Remained
	Hazel	Female	18-24	Bachelor's Degree			Left
Team9	Ian	Male	25-34	Bachelor's Degree	Venture Development	Venture Development	Remained
	Ed	Male	25-34	Bachelor's Degree			Left

Appendix A. Overview of cases

Note: T1= Venture stage at first interview, T2 = Venture stage when co-founder left

Team	Name	1	2	3	4	5	6	7	8	9
Team 1	Peter	High	1.25	0.18	High	1.00	0.35	High	10.00	0.35
	Michael		1.00			1.50			9.50	
Team 2	Jenny	Low	1.25	0.53	Low	1.50	0.71	Low	10.00	1.06
	Dave		2.00			2.50			8.50	
Team 3	Matthew	Low	5.00	1.09	Low	5.00	0.72	Low	6.00	1.78
	Mark		3.25			3.75			8.80	
	Luke		3.00			3.75			5.50	
Team 4	David	High	1.00	0.00	High	2.00	0.53	High	10.00	0.42
	Stephen		1.00			1.25			9.40	
Team 5	Nathan	High	1.25	0.18	High	1.50	0.18	High	9.60	0.28
	Richard		1.00			1.75			10.00	
Team 6	Wayne	High	1.25	0.18	High	2.00	0.53	High	8.00	0.64
	Darren		1.00			1.25			7.10	
Team 7	Thomas	Low	1.75	0.54	Low	1.25	0.66	Low	8.80	0.82
	Eva		2.50			2.75			8.10	
	Jason		1.25			1.50			10.00	
	Francesco		1.50			2.00			8.50	
Team 8	Max	Low	2.25	0.61	Low	2.50	0.78	Low	8.80	1.21
	Micah		1.50			2.00			10.00	
	Andrew		3.00			3.75			6.50	
	Sam		2.25			2.25			8.00	
	Sean		3.50			2.00			7.50	
	Hazel		2.00			3.25			8.80	
Team 9	Ian	Low	3.00	0.53	Low	1.50	0.88	Low	7.80	0.92
	Ed		2.25			2.75			6.50	

1. Shared Cognition Relationship Conflict; 2. Relationship Conflict Mean; 3. Relationship Conflict Standard Deviation; 4. Shared Cognition Task Conflict; 5. Task Conflict Mean; 6. Task Conflict Standard Deviation; 7. Shared Cognition Team Cohesion; 8. Team Cohesion Mean; 9. Team Cohesion Standard Deviation

Appendix B. Shared Cognition

5 | PAPER THREE

'Till Death Do Us Part': Applying the Marriage Metaphor to Investigate Co-founder Exits

Abstract

The co-founder relationship is frequently likened to a marriage. This has resulted in the dissemination of actual 'marriage therapy for co-founders', i.e., prescribing marital interventions to co-founders. Though intuitively there seem to be many parallels between a romantic relationship and a co-founder relationship, the marriage concept has yet to be tested in the entrepreneurship context. Building on theories of entrepreneurial affect, we adapt methodologies designed for marriage research to investigate the fundamental assumptions of the marriage and divorce metaphor: that relationship conflict and negative affect increase the likelihood of co-founder exits. By capturing dynamic, objective and continuous affective data during team conflict episodes, we find that relationship conflict and negative affect are not predictive of a co-founder exit. Yet, surprisingly, we find task conflict and positive affect to be significant predictors. Hence, we introduce a new variable—masked positivity—which is highly predictive of a subsequent co-founder exit and team separation. We discuss the implications of our study for research on affect, co-founder exits and founding team conflict.

5.1 INTRODUCTION

The exceptionally affective nature of entrepreneurship means that affective dynamics play a crucial role in the relationships within a founding team (Baron, 2008), with negative interaction spirals leading to co-founder exits (c.f. Breugst, Patzelt, & Rathgeber, 2015). Entrepreneurship scholars note that the affective dynamics in founding teams are similar to that of a marriage, and hence use marriage as a metaphor to describe the intimate and affective nature of the co-founder relationship. Seminal scholars note that literature on "*falling in love*" offers insights into the co-founder relationship (Gartner, 1993, p. 237), that the co-founder relationship is "*like a marriage*" (Winter, 1993, p. 23), and that the "*honeymoon period*" impacts ventures (Fichman & Levinthal, 1991, p. 442). While this metaphor may make intuitive sense, it has never been tested in the entrepreneurship context, yet the pervasive, long-standing application of the metaphor has led to famous co-founders turning to couple therapy in a bid to avoid co-founder 'divorce'—defined as the exit of a co-founder from a founding team (Holson, 2015). Further, couple therapists also exploit the co-founder marriage metaphor, offering co-founder "couple therapy" sessions and podcasts (Perel, 2020). Thus, given the intuitiveness and pervasiveness of this metaphor in literature (Kellogg, 2011), teaching (Hale, 2019), and coaching (Bailey, 2019), there is a critical need to test if this marriage lens holds up in reality.

Despite the application of the marriage lens in entrepreneurship, there is little integration between the two streams of literature. On the one side entrepreneurship scholars investigate both the consequences of *relationship conflict* (disagreements about interpersonal issues, e.g. Ensley & Hmieleski, 2005; Ensley, Foo, 2011, Pearson, & Amason, 2002), and the impact of negative affect on co-founder relationships (Baron, 2008; DeTienne & Cardon, 2012). Given that the relationships in founding teams take priority in the beginning (Kamm & Nurick, 1993, p. 18), it makes sense that conflict which is about the relationship itself may be predictive of an eventual co-founder exit, compared to that of *task conflict* (disagreements about tasks being performed; Jehn & Bendersky, 2003). However, the methods being used tend to be static, and the measures are retrospective (e.g. Jehn, 1995; Watson, Clark, & Tellegen, 1988) and thus lack precision in predicting an exit. This lack of precision is problematic considering a sizeable amount of entrepreneurial teams experience at least one team member exit (40%) (Grilli, 2011; Hellerstedt, 2009; Le et al., 2017), and that these exits can have serious personal consequences for the departing member (Shepherd, Wiklund, & Haynie, 2009), and the business (Le et al., 2017).

On the other side, marital researchers have fine-tuned precise methodology to study relationship conflict and negative affect in dynamic, real-time ways over the last 40 years (Barling & Cooper, 2008). Using these methods, marital researchers have gained substantial predictive power (ibid), e.g. they can predict divorce with 93% accuracy based on the affective dynamics in a relationship (Gottman & Levenson, 2000). However, it is unclear whether results like these can be

transferred to founding teams as the affective dynamics between founders might be different from those in a romantic relationship. Entrepreneurship research is still ambiguous about how levels of relationship conflict and negative affect can predict a co-founder exit. Thus, there is an urgent need to i) test if the main assumptions of the marriage lens hold true in founding teams, and ii) explore what new insights we can garner about the affective dynamics that predict a co-founder exit.

Hence, we build on the affective theories in entrepreneurship, and integrate the concepts and methodologies used in marital research (e.g. Gottman & Levenson, 2000). We test the two core assumptions of the marriage metaphor—that relationship conflict and negative affect are at the heart of co-founder exits. Specifically, we adapt the data collection methods in marital research (Gottman et al., 2002; Gottman et al., 1998) to study 29 founding teams over a period of 12 months. We collect continuous, dynamic, affective data by monitoring affect and facial expressions in team interactions throughout a 90-minute observation session.

Based on this data we produce three important contributions. First, we call into question the first core assumption of the co-founder marriage metaphor: that relationship conflict is the most important predictor of the eventual 'divorce' of founding teams (Gregori & Parastuty, 2021; Vanaelst et al., 2006). We find evidence that relationship conflict is insignificant in predicting a co-founders exit, whereas task conflict is significant. This finding contributes to wider founding team conflict literature by questioning the perspective that task conflict is beneficial for relationships and performance in teams (Bradley et al., 2012).

Second, we contribute to literature on entrepreneurial affect by introducing a new, significant variable in co-founder exits: *masked positivity*. Contrary to findings in both marital research and entrepreneurship research that suggest negative affect is a key variable in predicting an exit (Breugst et al., 2015; Gottman & Levenson, 2002), we find that positive affect is a key variable. In line with wider organisational behaviour literature, we demonstrate that high levels of positive affect, when unexplained by either a close relationship or high performance, reflect masked positivity. Masked positivity represents a founder's psychological inflexibility to accept and regulate negative affect, and is significantly predictive of future co-founder exit.

Finally, we contribute to the theory of co-founder exits by highlighting an important distinction between the marriage relationship dynamic and the co-founder relationship dynamic. Given that not all ventures are founded with the goal of 'till death do us part', but separate due to desire to harvest financial capital and start a new business, not all co-founders exit due to negative affect and relationship conflict. This distinction highlights a significant shortcoming in the marriage metaphor for both, theory on co-founder exit and couple therapy practice.

5.2 THEORETICAL UNDERPINNINGS OF THE MARRIAGE METAPHOR

In developing our model of conflict and affect in co-founder exits (*figure one*), we investigate the theoretical underpinnings of the marriage metaphor. We discuss the commonalities and differences between theories of marital separation and founding team separation. In this study, we empirically investigate the underpinnings of the marriage metaphor in the entrepreneurial context at both the individual and team level. More specifically, there are three core theoretical commonalities between marriage and entrepreneurship literature that underpin the marriage metaphor: that relationship conflict leads to exits from marriage and founding teams (Carrère & Gottman, 1999; Vanaelst et al., 2006), that negative affect is detrimental to relationships (Gottman et al., 2002; Lucas & Diener, 2003), and that affective patterns are important in couples and founding teams (Breugst & Shepherd, 2017; Gottman & Levenson, 2000).

5.2.1 Relationship conflict and co-founder exits

Relationship conflict has been established as an important variable in research on exits from a marital relationship (Carrère & Gottman, 1999) and exits from a founding team (Breugst et al., 2015; Vanaelst et al., 2006). Yet, there is a core difference in the conceptualisation of conflict across these domains. First, in marriage research all conflict is considered 'relationship conflict'. For example, marital researchers do not consider conflict about which spouse performs which task at home 'task conflict'. Conflict is not divided into relationship or task conflict, but is distinguished by affective patterns (Gottman, Driver, & Tabares, 2015).

Whereas in entrepreneurship research relationship conflict is defined as conflict caused by interpersonal animosity (Choi & Cho, 2011), and it centres around personal differences (Yang & Mossholder, 2004). Yet, conflict about how to perform tasks at work would be categorised as 'task conflict' (Jehn, 1995), not relationship conflict. Hence, conflict is not distinguished by 'conflict styles'. Therefore, to align these two streams of literature we need to explicitly test if relationship conflict is the main type of conflict that predicts co-founder exits as opposed to task conflict. On the one hand relationship conflict at the individual level is related to a founder leaving their venture (Vanaelst et al., 2006), and at the team level (*team mean*) it is negatively related to new venture team cohesion (Ensley et al., 2002), to venture growth (Ensley & Hmieleski, 2005) and it reduces team effectiveness (Khan, Breitenecker, & Schwarz, 2015). On the other hand, mild task conflict at the individual level is positively related to information acquisition (Todorova et al., 2014), and at the team level (*team mean*) task conflict can improve decision quality (Amason, 1996) and task performance (Pelled et al., 1999). Further, at the team level, increased variance (*standard deviation*) in the perception of task and relationship conflict decreased performance and creativity in groups (Jehn, Thatcher, & Rispens, 2010).

Taken together, we offer the following hypotheses:

> ***Hypothesis 1A***: Increased relationship conflict at the individual level will be predictive of a co-founder exiting their venture.
> ***Hypotheses 1B & 1C***: Increased team relationship conflict (1B) and increased within-team variance in the perception of relationship conflict (1C) will be predictive of a team separating.
> ***Hypothesis 2A***: Increased task conflict at the individual level will decrease the likelihood of a co-founder exiting their venture.
> ***Hypothesis 2B***: Increased task conflict at the team level will decrease the likelihood of founding team separation.
> ***Hypothesis 2C***: Increased variance in the perception of task conflict will increase the likelihood of a founding team separating.

5.2.2 Negative affect and co-founder exits

The second theoretical commonality across both domains is that negative affect has a deleterious impact on both marital relationships (Gottman & Levenson, 2002), and co-founder relationships (DeTienne & Cardon, 2012). Yet, there is a difference between the conceptualisation of negative affect across both domains. One the one hand, marital scholars conceptualise negative affect as universally detrimental, especially so when there is more negative than positive affect throughout interactions (Gottman & Levenson, 2000). Research finds that a high level of negative affect at the beginning of a relationship conflict episode, called a '*negative start-up*', is predictive of later divorce (Gottman et al., 1998). Further, marital researchers investigate the role of negative affect at the couple level, called '*negative affect reciprocity*', to predict marital stability (Gottman et al., 1998). Yet, on the other hand in entrepreneurship research, negative affect at the individual level can lead to more narrow goals and reduced entrepreneur satisfaction (Delgado-García, Rodríguez-Escudero, & Martín-Cruz, 2012), and enhances preferences for avoidance, denial and other less effective coping strategies (Baron, 2008). At the team level (*team mean*) negative affect leads to a decrease in desire for future interactions (Allred et al., 1997), and increased variance in a team's shared affect (*standard deviation*) increases conflict and decreased cooperation (Barsade et al., 2000).

Taken together, we propose the following:

> ***Hypothesis 3A***: Increased negative affect at the individual level will be predictive of a co-founder exiting their venture.
> ***Hypotheses 3B & 3C***: Increased negative affect at the team level (3B), and greater variance of negative affect within teams (3C) will be predictive of a founding team separating.

5.2.3 Affective patterns and co-founder exits

Affective patterns—how affect fluctuates throughout interpersonal interactions (Emich, 2020)—has important consequences for marital exits. For example, mar-

riage researchers have used dynamic data collection procedures to build comprehensive models about the affective patterns that lead to divorce. One central theory—the balance theory of marriage—posits that the pattern of affect, i.e. the balance of positive to negative affect, is critical in predicting long-term outcomes like divorce (Gottman & Levenson, 1992). The strength of this theory is illustrated by Gottman and Levenson's (2000) study, where they accurately predicted divorce 93% of the time based on the affective patterns throughout 15-minute samples of the couple's interaction. Based on this theory, couples are sorted into two categories, the first is couples that have a pattern of more positive than negative affect in their interactions, and the second is couples that have a pattern of more negative than positive affect in their interactions. The affective pattern of more negative than positive affect repeatedly predicts divorce (Gottman & Leveson, 1992). In entrepreneurship research, the study of affective patterns has revealed important insights for founding teams, for example showing that uncertainty attenuates negative affective (Breugst & Shepherd, 2017), yet there is very little research to date that investigates the affective patterns in the lead up to a co-founder exit.

Given that the affective dynamics in founding teams may be of less importance than in marriages as founders are not seeking intimacy from their partner, but rather business success, questions about what affective dynamics are an antecedent to co-founder exits arise. Nevertheless, at the individual level 'venturesomeness' is associated with a higher ratio of positive to negative affect in future entrepreneurs (Basinska & Dåderman, 2018) and with increased work satisfaction (Schutte, 2014). Further, at the team level, higher performing teams have a higher ratio of positive to negative affect (Losada, 1999). Hence, considering the above, we propose the following:

> ***Hypothesis 4A***: A lower ratio of positive to negative affect at the individual level will be predictive of a co-founder exiting their venture.
> ***Hypotheses 4B & 4C***: A lower ratio of positive to negative affect at the individual team level (4B), and greater variance the ratio of positive to negative affect within teams (4C) will be predictive of a founding team separating.
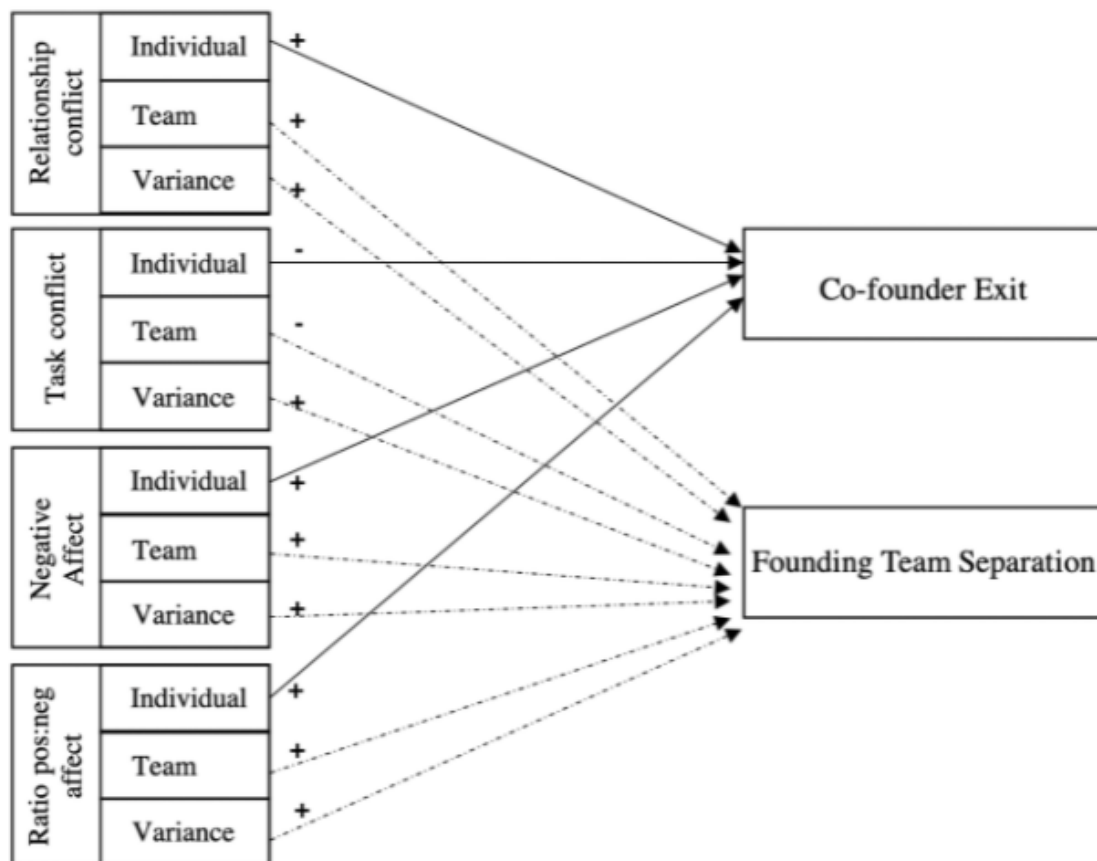
Figure 1: Proposed theoretical framework

5.3 METHOD

5.3.1 Sample

To address our research question, we collected data on venture teams in their early stages of development. These teams work together intensively to progress their business (Klotz et al., 2014) and frequently face challenges that result in high affect, conflicts and potential co-founder exits (Wright & Vanaelst, 2009). To identify teams during venture emergence we collected data from university associated incubator and accelerator programs. These programs support new ventures (Siegel, Wright, & Lockett, 2007), and the environment also enabled us to track these teams over a long period of time. We only focused on team members who were the co-founders of their venture, as these are the ones who make the strategic decisions of the venture (Klotz et al, 2014).

We identified a total of 140 start-ups participating in these programs. When possible, we collected the co-founder's names from their website and then contacted them, first by email and then either face to face or by phone. We were unable to contact 72 ventures. Of the remaining 68, 39 ventures were uninterested in participating, or did not fit our sample criteria due to being run by a lone founder,

being a corporate spin-off, or being older than five years (Amason, Shrader, & Tompson, 2006). The 29 teams were invited for an in-person observation session (see description below). Due to measurement error, data from one team (made up of three individuals) were subsequently excluded. Our final sample consists of 74 co-founders nested in 28 founding teams that fit our criteria – i.e. a team-based venture in its early stage. The 29 teams were invited for an in-person observation session (see description below). Participant age was categorized into four ranges: 18-24 years (31.1%), 25-34 (54.1%), 35-44 (10.8%), 45-54 (4.1%). 63 were male and 14 were female. Regarding their education, 6 had doctoral degrees, 11 held a master's degree, 26 had a bachelor's degree, and 34 were currently completing education. The average team size was 2.6 (SD = 1.07; Max = 6; Min = 2). According to registered NACE codes (European Industry-standard classification system), the ventures were from 9 different industries, such as manufacturing (36.3%); transportation (3.3%); scientific activities (23.3%); information and communication (10%); accommodation and food services (6.6%); wholesale (10%); mining (3.3%); arts and entertainment (3.3%); water supply and sewage (3.3%).

5.3.2 Data collection

Given our research aims to get a better understanding of how conflict and affect influence co-founder relationships and exit, we adopt an explorative lens to combine the data collection approaches used in marital research, with the data collection approaches in entrepreneurship research to assess how relevant the marriage metaphor is in predicting co-founder "divorce". Hence, to measure relationship conflict, negative affect and affective dynamics, we followed the procedures employed in martial research for data collection (see Gottman, 1979; Levenson & Gottman, 1983 for the procedure), while also utilizing scales commonly used in entrepreneurship research. The data collection procedures utilized from marital research has six steps.

First, we scheduled all teams in for a 90-minute observation session which took place in a naturalistic office environment fitted with small cameras and audio recording devices. Second, we collected informed consent and explained the purpose of the cameras and equipment in the office. The third, fourth, and fifth steps were adapted from Levenson & Gottman (1983) and had the teams completing three tasks. Task one (step 3) was an "events of the day" task (Levenson & Gottman, 1983), where teams were asked to engage in a typical conversation for ten minutes. After ten minutes, the facilitator ended the conversation. For task two (step 4), we followed Levenson & Gottman's (1983) conflict elicitation procedure, which included asking teams to complete a "problem inventory". Each person created and rated a list of problems facing the team. The team were then instructed to select the most important issues and asked to discuss their problems for 15 minutes. The facilitator left the room when the discussion commenced. For task three (step 5), the experimenter re-entered the room at the conclusion of the conflict discussion and followed Levenson & Gottman's (1983) process for

resolving tension by facilitating a debrief. Sixth, and finally, the participants answered a short questionnaire with demographic questions and the scales listed below.

5.3.3 Measures and Variables

An important distinction between spouses and co-founders is that once a partner leaves a marriage, the marriage is over. Yet, when a founder leaves a venture, the venture can continue, even after the team has separated. This contextual difference highlights the need to perform multilevel analysis to understand first how conflict and affective patterns predict *who* will leave a venture (i.e. an individual's level of conflict and affect) and second, what the team level *affective patterns* are that can predict team separation i.e. do the affective patterns of negative affect or greater affective variance increase the likelihood of a teams' separation?

5.3.4 Dependent Variables

Co-founder Exit is the categorical dependent variable at the individual level, in line with wider studies that investigate co-founder exits (e.g. Bates, 2005; Hessels et al., 2018). This dependent variable distinguishes co-founders who remained (value 0) from co-founders who exited their venture (value 1). It was measured by asking all co-founders, by email, phone or LinkedIn *"Are you still part of your new venture team?"* at six monthly intervals, over a period of 12 months. If any of the co-founder's informed us of a co-founder exit, we conducted follow-up interviews with both co-founders who left and those who remained to understand the context and reasons for them leaving. In our sample 28 (37.8%) co-founders left.

Founding Team Separation is the team level categorical dependent variable that distinguishes founding teams that remained intact with no co-founders exiting the venture (value 0) from founding teams that split up, with one or more co-founder(s) exiting (value 1). In our sample, 50% of teams split up.

5.3.5 Independent Variables

Task conflict and Relationship conflict were measured at the end of the observation session through a questionnaire that utilised Jehn's conflict scale (Jehn, 1995). For both task and relationship conflict, founders were asked to rate the level of conflict within their new venture team from 1 (*none*) to 5 (*a great deal*). Task conflict mean was 3.82 (SD = 1.46) and relationship conflict mean was 2.07 (SD = 0.79). Cronbach alpha values for the task conflict subscale (4 items; α = 0.88) and the relationship conflict subscale (4 items; α = 0.89) showed excellent reliability.. To justify aggregating the individual level data to the team level, we used intraclass correlation coefficient analyses (ICC 2; Bliese, 2000) and subsequently calculated the mean for each team (team level conflict variable; Ensley

et al., 2002) and the standard deviation for each team (team level conflict variance variable; e.g. Jehn et al., 2010). A principal components analysis (PCA) was subsequently run on the full 8-item conflict scale to create factor scores for use in logistic regression analyses. Two components were retained from the PCA with both components aligning perfectly to the 4-item relationship conflict subscale and the 4-item task conflict subscale. For illustrative purposes, means and standard deviations noted in this paper are based on the sums of the subscales instead of the factor scores.

Positive and negative affect were measured by capturing complete video recordings of whole team interactions in their observation sessions (Gottman & Levenson, 1983). In marital research, scholars utilise a coding system called the Specific Affect Coding System (SPAFF; Coan & Gottman, 1996), based on the Facial Action Coding System (FACS, Ekman & Friesen, 1976). FACS is composed of 44 action units—the position of one of more facial muscles—and describes specific facial expressions by objectively measuring facial expressions of emotions (Ekman, Friesen, & Hager, 2002). Both Gottman's SPAFF coding system, and FACS (Ekman & Friesen, 1976), are manually coded by trained experts on a frame-by-frame basis. These coding systems can often result in a lengthy coding process of approximately eight hours per three minutes of footage, per respondent (e.g. Jung, 2011). Given that this process is subject to bias due to both coder fatigue, and the affective state of the coder (Warnick, Davis, Allison, & Anglin, 2021), computer-aided facial expression analysis-based on FACS (Ekman & Friesen, 1976) has become a highly efficacious method of analysis of positive, negative and neutral affect from facial expressions (cf. Warnick et al., 2021). Therefore, to avoid human coder error, we utilised the AFFDEX Affectiva facial expression analysis algorithm (iMotions, 2019). The Affdex algorithm measures facial expressions frame-by-frame, typically 1/30th or 1/25th of a second (Montgomery, 2018) and produces a continuous affective score which measures the dynamic fluctuation of one's affect from very negative (0) to very positive (100). Hence, we analysed each co-founder's continuous, objective affect throughout their interaction session. This resulted in both a continuous affect score, and a percentage of the time spent displaying positive and negative affect throughout the interaction. The average time spent emoting positive affect was 10.24 (SD = 9.50). The average time spent emoting negative affect was 8.42 (SD = 5.67). We calculated this at the team level by taking the mean for each team (Barsade & Knight, 2015), and to capture variance we took the standard deviation within each team (Barsade et al., 2000).

Ratio of positive to negative affect was analysed by replicating techniques used in marital research. Specifically, we calculated a ratio of positive to negative affect for each individual in an interaction (Gottman, 1994). This ratio, also called a slope value, is a more dynamic measurement than the percentage of interaction emoting positive or negative affect, as it shows the evolution of positive to negative affect across an interaction. To calculate this value, we took the raw second by second data from the iMotions Affectiva algorithm (iMotions, 2019) and wrote a script in Matlab (Matlab, 2019) to transform the affective data into

+1 for positive affect, -1 for negative affect or 0 for neither. We then calculated the cumulative sum of each data point across the whole conversation (as in Jung & Leifer, 2011). The data were plotted over the entire interaction, resulting in participant graphs (see figure two for the slope values of a single venture team with four co-founders). Finally, we determined the slope value of each graph using a linear regression analysis (Gottman & Levenson, 1992). At the team level, we calculated the mean for each team (Barsade & Gibson, 2012), and for the variance we calculated the standard deviation within each team (ibid).
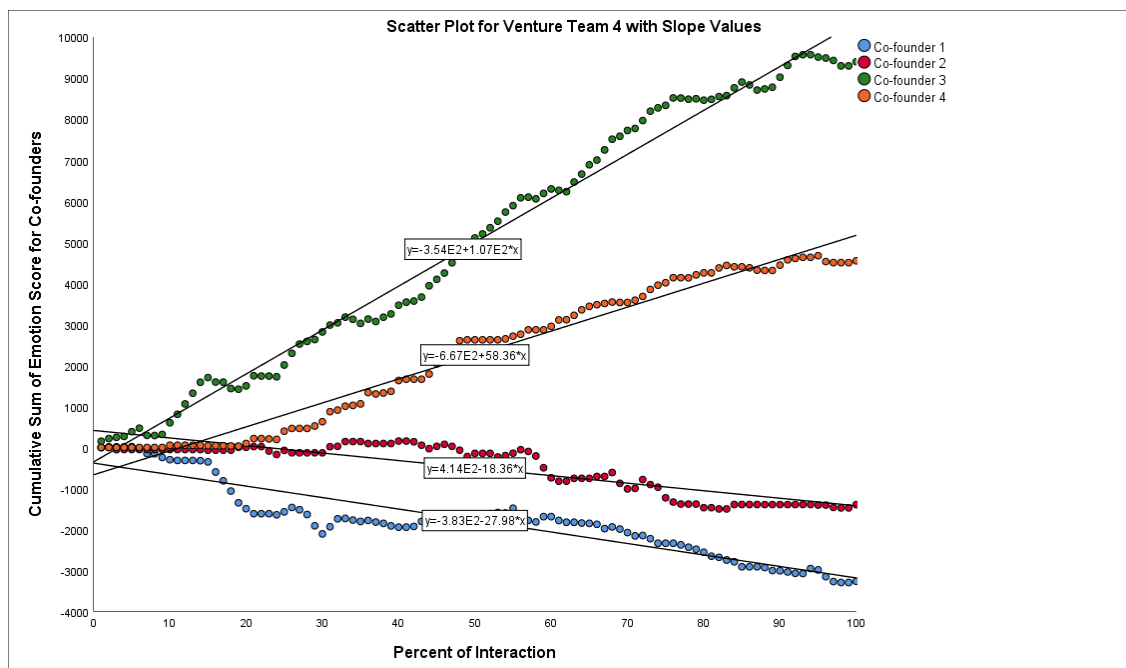
Figure 2: Example of a team four's slope values shown on a scatter plot

5.4 DATA ANALYSIS AND RESULTS

5.4.1 Descriptive Statistics and Correlations. Table 1 shows an overview of the dependent and independent variables, the descriptive statistics and correlation matrix. At the individual level, we tested for differences between male and female co-founders. We found significant differences between genders ($\chi2(1) = 8.28$, p = .004). However, due to the extremely unbalanced sample with respect to gender (14 female participants to 60 male participants), we chose not to include gender in the logistic regression models. At the team level, we tested for differences between dyadic (i.e. 2 people) and non-dyadic (i.e. 3 or more people) teams and found no significant differences ($\chi2(1) = 2.49$, p = .115).

TABLE 1. Descriptive statistics and correlation matrix

Individual-level Variables (N = 74)	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Status of Cofounder[†]	0.38	0.49	(-)													
2. Relationship Conflict	7.00[#]	3.15[#]	-0.14	(.89)												
3. Task Conflict	8.30[#]	3.15[#]	0.19	0.00	(.88)											
4. Negative Affect	1.18	26.44	0.01	0.06	0.13	(-)										
5. Ratio Positive:Negative	8.42	5.67	0.27*	-0.17	-0.14	-0.46**	(-)									
Team-level Variables (N = 28)																
6. Status of Venture[§]	0.50	0.51						(-)								
7. Relationship Conflict (M)[¶]	6.61[#]	2.89[#]						0.09	(-)							
8. Task Conflict (M)[¶]	7.93[#]	2.68[#]						0.30	0.33	(-)						
9. Negative Affect (M)[¶]	8.26	3.28						0.34	-0.02	0.223	(-)					
10. Ratio Positive:Negative (M)[¶]	0.94	16.61						0.27	-0.18	-0.29	-0.20	(-)				
11. Relationship Conflict (SD)[¶]	0.98[#]	1.04[#]						0.39*	0.50**	0.41*	0.12	0.10	(-)			
12. Task Conflict (SD)[¶]	1.59[#]	1.10[#]						0.61**	0.10	0.23	0.10	0.16	0.58**	(-)		
13. Negative Affect (SD)[¶]	4.91	2.88						0.19	-0.03	0.20	0.75**	-0.01	0.22	0.21	(-)	
14. Ratio Positive:Negative (SD)[¶]	16.08	21.59						0.31	-0.11	-0.16	0.31	0.74**	0.05	0.16	0.40*	(-)

Notes: Cronbach's alpha (if applicable) is reported on the diagonal. M = mean. SD = standard deviation.

Pearson correlation coefficients are shown. ** *p*-value < .01, * *p*-value < .05.

[†] 0 = "cofounders who stayed," 1 = "cofounders who left."

[§] 0 = "ventures that remained intact," 1 = "ventures that split up."

[¶] These variables were measured at the individual level and aggregated to the team-level by taking team means (M) and team standard deviations (SD).

[#] Values calculated based on the relationship and task conflict subscales instead of the factor scores for illustrative purposes.

5.4.2 Hypothesis Testing Logistic regression is the most appropriate method to test our hypotheses, given that our dependent variables—co-founder exit and founding team separation—are dichotomous. This method is widely accepted as the most effective at predicting outcomes that represent distinct decisions (Forrester & Neville, 2021). Further, by computing the odds ratio for each independent variable, we will understand their impact on the outcome variables (Forrester & Neville, 2021). For each model, we tested the following assumptions: linearity of the continuous variables with respect to the logit of the dependent variable assessed via the Box-Tidwell procedure (Box & Tidwell, 1962); multicollinearity between the variables (i.e. there were no correlation coefficients greater than .80; Dancey & Reidy, 2017); no significant outliers (Field, 2018); and adequate sample size (Jenkins & Quintana-Ascencio, 2020; Peng et al., 2002). No assumptions were violated for any of the logistic regression models and there are only two notes to make in relation. First, while not considered a violation of the assumption of an adequate sample size, the team level models do have small sample sizes and results should be interpreted conservatively. Second, while there was no multicollinearity found between 'ratio positive:negative' and 'negative affect', these variables are intuitively similar and significantly correlated. To avoid confounding results, they were entered in models separately instead of together. The regression results for all models are provided in Table 2.

In model 1.1 we test relationship conflict, task conflict and negative affect at the individual level. Counter to our expectations, relationship conflict (H1A) is not a significant predictor in model 1.1 (p = .201) or model 1.2 (p = .338). Negative affect (H3A) is also not a significant predictor (p = .932). Task conflict (H2A) is found to be significant at the p < .10 level (p = .093) in model 1.1 and significant at the p < .05 level (p = .040) in model 1.2. Although significant, the results suggest a relationship opposite to what we hypothesized (i.e. increased task conflict increased the odds of a co-founder exit). Interestingly, the ratio of positive to negative affect is a significant predictor of co-founder exit (p = .036).Yet, when we assessed the directionality of the slope value, we find the mean slope value for those who left is 10.15 (SD = 33.85), while the mean value of those who stayed is -4.29 (SD = 19.12), suggesting the more positive the slope, the more likely an individual was to leave (i.e. the more positive to negative affect expressed in an interaction, the more likely a co-founder was to exit their venture). The results from models 1.1 and 1.2 directly contradict our expectations. Taken together, we find no support for hypotheses 1A, 2A, 3A or 4A. On the contrary, we find significant results that suggest the opposite of the hypotheses regarding both the role of task conflict and the ratio of positive to negative affect at the individual level.

Table 2. Binary logistic regression, DV (Model 1) = Co-founder exit, DV (Models 2-3) = Founding team separation

Model Statistics	Model 1.1 (n = 74)		Model 1.2 (n = 74)		Model 2.1 (n = 28)		Model 2.2 (n = 28)		Model 3.1 (n = 28)		Model 3.2 (n = 28)	
Chi-square (df)	4.56 (3)		10.81 (3)**		5.14 (3)		7.62 (3)*		13.16 (3)***		14.47 (3)***	
-2 Log likelihood	93.60		87.36		33.68		31.20		25.66		24.35	
Nagelkerke R Square	.08		.19		.22		.32		.50		.54	
Variable Statistics	B (SE)	Odds Ratio	B (SE)	Odds Ratio	B (SE)	Odds Ratio	B (SE)	Odds Ratio	B (SE)	Odds Ratio	B (SE)	Odds Ratio
Constant	-.50 (.45)	.61	-.59 (.26)**	.56	-1.68 (1.33)	.19	.13 (.45)	1.14	-3.10 (1.38)**	.05	-3.39 (1.33)**	.03
Relationship Conflict[†]	-.34 (.27)	.71	-.26 (.28)	.77								
Task Conflict[†]	.44 (.26)*	1.55	.56 (.27)**	1.75								
Negative Affect[†]	-.004 (.05)	1.00										
Ratio Positive:Negative[†]			.03 (.01)**	1.03								
Relationship Conflict (M)[§]					.07 (.53)	1.08	.20 (.57)	1.22				
Task Conflict (M)[§]					.73 (.66)	2.08	1.56 (.84)*	4.75				
Negative Affect (M)[§]					.21 (.15)	1.24						
Ratio Positive:Negative (M)[§]							.07 (.04)*	1.07				
Relationship Conflict (SD)[§]									.73 (1.43)	2.07	.71 (1.43)	2.04
Task Conflict (SD)[§]									4.22 (1.79)**	68.01	3.95 (1.76)**	52.07
Negative Affect (SD)[§]									-.004 (.18)	1.00		
Ratio Positive:Negative (SD)[§]											.03 (.03)	1.03

* $p < .10$, ** $p < .05$, *** $p < .01$

[†]Individual-level variables.

[§]Team-level variables measured at the individual level and aggregated to the team-level by taking team means (M) and team standard deviations (SD).

In model 2.1 we test relationship conflict, task conflict and negative affect at the team level (team mean). Echoing the results of model 1, relationship conflict (H1B) is not a significant predictor in model 2.1 (p = .888) or model 2.2 (p = .722). Negative affect (H3B) is not a significant predictor (p = .161). In model 2.2 task conflict is a significant predictor (p = .064) and the ratio of positive to negative affect (H4B) is also found to be significant (p = .068). Interestingly, both task conflict and the ratio of positive to negative affect have the opposite relationship than expected. For task conflict, we find increased task conflict leads to increased odds of founding team separation. For the ratio of positive to negative affect, we find that the more positive a team is (i.e. increased ratio pos:neg), the more likely they are to separate. Taken together, we find no support for hypotheses 1B, 2B, 3B or 4B. On the contrary, we find significant results that suggest the opposite of the hypotheses regarding both the role of task conflict (mean) and the ratio of positive to negative affect (mean) at the team level.

In model 3.1 we tested the variance within teams for relationship conflict, task conflict and negative affect (standard deviation).Variance in relationship conflict (H1C) is not a significant predictor of founding team separation in model 3.1 (p = .612) or model 3.2 (p = .617). Variance in negative affect (H3C) is not found to be significant (p = .985). Variance in ratio of positive to negative affect (H4C) is not significant (p = .317). Variance in task conflict (H2C) is a significant predictor of founding team separation in both model 3.1 (p = .018) and model 3.2 (p = .024). Taken together, we only find support for hypothesis 2C (i.e. increased variance of task conflict leads to increased odds of founding team separation).

Taken together, counter to the main assumptions of the marriage metaphor (i.e. increased relationship conflict and lower ratio of positive to negative affect would increase the likelihood of co-founder exit and team separation), we find results that are surprising both for the non-significance of certain predictors, but also for the flipped directionality of significant predictors. First, relationship conflict was surprisingly non-significant in all models. Instead, we find task conflict to be a significant predictor (individual level; team level mean; team level standard variation).

Second, while the ratio of positive to negative affect was a significant predictor, we are particularly surprised by the directionality of the relationship. We expected the ratio of positive to negative affect to act in a similar way to negative affect (i.e. lower ratio of positive to negative affect indicates more negative affect and thus was expected to increase the odds of exit/separation). However, our results suggest instead that the more positive a founder or team was (i.e. higher ratio of positive to negative affect), the more likely they were to exit or separate. Given the complete lack of significance of negative affect in our models, in addition to this counterintuitive result with the ratio of positive to negative affect, we performed additional post-hoc interviews with founders and teams who exited or experienced a co-founder exit to explore the role of positive affect in more detail

and to guide our additional post-hoc insights (Grichnik, Brinckmann, & Kapsa, 2009).

5.5 POST-HOC ANALYSIS

5.5.1 Qualitative Data

We conducted supplementary, explorative qualitative data collection to seek additional data based on the insights developed from our initial data analysis (Ligita et al., 2020). We adopted a theoretical sampling approach, as is common when seeking additional information in a study (ibid). Given our focus on co-founder exits, we re-contacted all 14 teams that experienced a co-founder exit and asked the co-founders who left, and those who remained, to participate in a follow-up interview to discuss the exit process. Theoretical sampling was suitable here given our exclusive focus on co-founder exits, as it enabled us to select cases that would offer theoretical insights (Miles & Huberman, 1984). Of the 14 teams contacted, 11 agreed to be interviewed. We could not make contact with 3 teams due to venture closure. All 11 interviews took place over video conferencing software, and lasted between 35 – 60 minutes. We utilised a semi-structured interview approach (Saunders, Lewis, & Thornhill, 2019), using an interview guide throughout the interview to focus on the main themes of conflict, affect and co-founder exits. All interviews were completed in English and transcribed verbatim. In addition to the transcription of the interviews, we also transcribed the recordings for task one and task three from the observation sessions for each team that experienced an exit. We followed open-coding procedures to develop first-order codes (Gioia et al., 2013), then we moved to axial coding to develop second-order coding (Corbin & Strauss, 1990). We integrated all first and second-order codes into higher-order themes. Our data showed three higher-order themes that contextualise our existing quantitative results.

5.5.2 Qualitative Insights

The three core qualitative themes were (i) that task conflict is an important antecedent for a co-founder exit, (ii) that founders often remain close friends after a co-founder exit, and (iii) that positive affect can be used to mask problems.

First, task conflict emerged as an important antecedent to co-founder exits. For example, George, a co-founder who left team 4, detailed that the conflict which prompted him to exit his venture was about the tasks needed to register the company, specifically about the pace the venture was moving at in registering the company, not relationship conflict.

"I (left) at the point when we were looking at sort of creating the company and registering it. They were looking at going full-time on this project. And at the time I was… unsure of how much time I would have… They were really moving forward… I thought,

well I wanted to let them to go full steam ahead and work as much as they wanted and not feel like I was freeloading. Or holding them back" - George, Team Four

Further, when we asked Nate, a co-founder who left team three if he experienced relationship conflict he said "*no, not on a personal level*". The absence of relationship conflict was also echoed by many of the co-founders who experienced a team split, they detailed the role of task conflict. Jans, a leaver from team six, said "*So we did definitely have a big conflict at the end…because we weren't exactly aligned on which way we should proceed. Yes that conflict was the main reason I wanted to leave. The project I thought was quite interesting.*" He discussed that the team disagreed about the tasks needed to progress the venture, hence the conflict was not centred about any relationship issues. Hence, these insights further provide evidence to contextualise the surprising results from our quantitative analyse. Specifically, while relationship conflict is at the centre of a marital exit, in founding teams task conflict plays a significant role in the exit process.

The second theme which emerged was that former co-founders would remain close friends, even after splitting up. For example, Sam from team four said that "*George and I are still close friends, so it had no effect on our relationship that I left*". Nate from team three echoed this when he said "*I think the relationship hasn't changed. I'm still good friends with Charles. And nothing really changed there.*" This sentiment was shared by Marcus (team one) and Jade (team seven), who said that "*personally I think this (me leaving) might be good for our friendship as well*" and "*we are all good friends still*", respectively. As we analysed the data from interviews with these co-founders, we realised that unlike marriages where hostility, stonewalling and contempt (negative affect) play are antecedents to a "bitter" end of a marriage (Fowler & Dillow, 2011), a co-founder can exit their venture without having experienced a relationship breakdown. Rather they can exit due to personal circumstances like losing interest in the venture or to pursue a new job opportunity. Hence, this provides context as to why negative affect was not the variable of interest that we expect.

Finally, we compared and contrasted the qualitative interview data with the qualitative observation session data for co-founders who exhibited a high level of positive affect in their observation session, yet went on to exit their venture. Take for example Christie, a co-founder who left team twelve. She spent 16% of their interaction emoting positive affect, compared to her co-founder Oliver (who remained), who spent 4.8% of their interaction emoting positive affect. While Christie was emoting positive affect during their interaction, she noted to Oliver while smiling that "*I actually think it's very difficult to find things (problems to discuss), and it's not because it's… well, I think the way we communicate we solve all our issues.*" Yet months after she had left, in her interview she noted:

"[Topics] you don't talk about become very difficult to fix… Out in the open there wasn't nearly as much conflict as there was under the surface. The story in our case is that I haven't been happy with our cooperation for a long time… So I kind of had

this idea of how we should be cooperating and it just never matched up... so anyway I realised that I didn't want to continue if we weren't able to make our relationship better. And I also realised that asking this (to have a better relationship) might result in the death of the start-up, and it did."

Christie was not alone in reporting low levels of conflict, yet masked with positive affect throughout team interactions. Many of the co-founders who left their venture experienced the same pattern: in the observation session they would emote significantly more positive affect than their co-founders, yet they went on to leave, and then detailed their longstanding dissatisfaction with their relationship. This provides a potential justification as to why the slope value indicated that more positive co-founders went on to exit their venture, because some co-founders used positivity to mask negative affect and did not have the ability to express negative affect, rather they denied, resisted and covered it with positive affect (Hugten et al., 2021). This level of positive affect can become toxic if positive affect is used as a tool to silence authentic, negative affect (ibid). Hence, we propose a new variable to explore in future research: *masked positivity*.

Considering the three themes that emerged from our qualitative insights, it becomes clear that there are contextual differences between a marriage relationship and a co-founder relationship that changes which variables can predict a co-founder exit. Specifically, rather than relationship conflict and negative affect as two key variables, task conflict and positive affect emerged as potentially important variables to investigate further.

As a final step in our qualitative analysis, we utilised both the qualitative data from the follow-up interviews, and the conflict episode and team interactions to code for different types of positive affect. Four distinct types of positive affect emerged. The first group, 'not positive', was founders who displayed no to very little positive affect (44 founders), the second group, 'positive due to success', were founders who displayed a lot of positive affect when discussing their recent success in their venture (i.e. recently secured funding, made significant sales, or recently grown in headcount; 6 founders), the third group, 'positive due to friendship', was founders who expressed positive affect due to having a very positive and close relationship with their co-founder (e.g. being best friends or married; 19 founders), the fourth group, 'unexplained positive' were founders who were positive despite having neither success or a close relationship with their co-founder (9 founders). A crosstabs analysis with this new variable and our outcome variable (co-founder exit), we found significant differences (i.e. co-founders who left were more likely to be coded as 'unexplained positive'; $\chi^2(2)$ = 10.96, p = .004). Specifically, 31.82% of the 'not positive' co-founders went on to exit their venture; 0% of the 'positive due to success' co-founders went on to leave their venture; 57.88% of the 'positive due to friendship' co-founders went on to leave their venture; and finally 100% of the 'unexplained positive' co-founders went on the exit their venture. This further contextualises our surprising findings that positive affect is a key variable in the co-founder exit process, and

emphasises how different categories of positive affect have different outcomes for co-founders.

Overall, taking together our primary analysis and post-hoc qualitative analysis we did not find support for our proposed conceptual framework (*figure one*). Rather, our results reveal surprising insights. First, we theorised that negative affect would be highly predictive of future co-founder exits, as it is in divorce. Not only was this hypothesis unsupported, we found the opposite to be true. We found that positive affect was predictive of a co-founder exit and team separation. To explain these counterintuitive results, we introduce a new, important variable in co-founder exits: *masked positivity*. Second, we theorised the detrimental impact of relationship conflict on co-founders, yet we found that rather task conflict was a key variable in predictive a co-founder exit and team separation. We sum these findings up in a revised model (*figure three*).
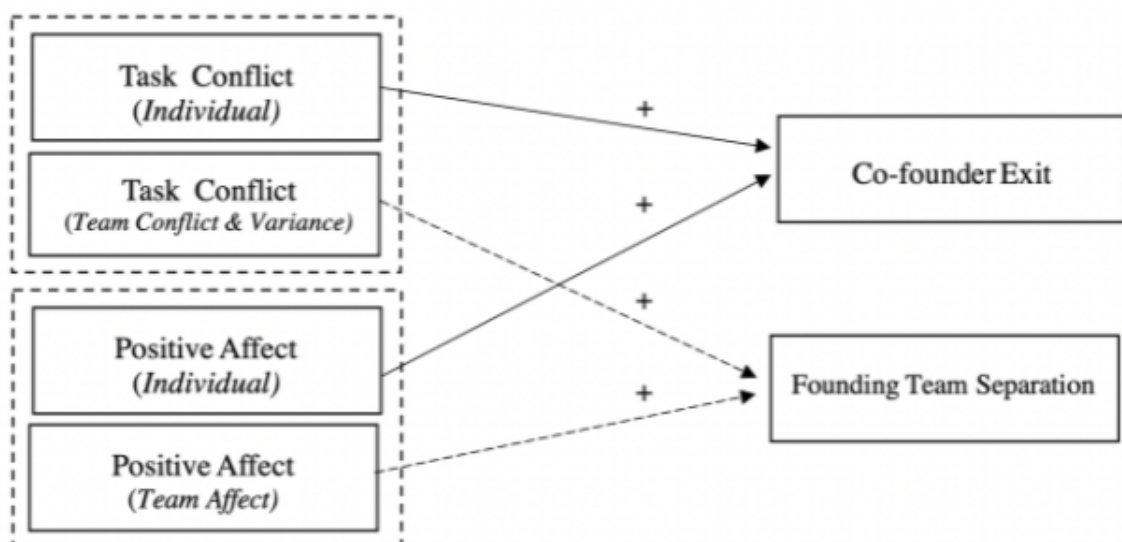

Figure 3: Final theoretical model

5.6 DISCUSSION

The pervasive application of the marriage metaphor in entrepreneurship research (e.g. Fichman & Levinthal, 1991; Gartner, 1993) and practice (e.g. Bailey, 2019; Hale, 2019), and has led many founders to turn to couple therapy in a bid to save their venture (Holson, 2015). Yet, the marriage lens itself is ambiguous due to differences in the conceptualisation of relationship conflict and negative affect, hence by applying untested advice from marriage therapy (like reducing negative affect and increasing positive affect in interactions) we risk further derailing at risk founding teams. Hence, due to the pressing need to investigate this metaphor, we tested this lens empirically for the first time by adapting approaches specifically designed for marriage research (e.g. Gottman & Levenson, 2000). We find that core variables which predict a marriage exit do not predict a co-founder exit; specifically, task conflict and positive affect emerged as important variables

in predicting a co-founder exit, not relationship conflict and negative affect. This calls into question the application of the marriage metaphor to the co-founder relationship. We now discuss how this study contributes to current *entrepreneurial affect, entrepreneurial team conflict and co-founder exit theory*.

First, we add to existing theories on *entrepreneurial team conflict* by focusing on the distal outcome of co-founder exit, at both the individual and team level. Counter to expectations, we found that relationship conflict was insignificant in predicting a co-founder exit at both the individual and team level. Prior literature posits that relationship conflict can lead to negative affect and "*departure by the offended team members*" (Ensley et al., 2002, p. 366), yet we found that at the individual and team level, task conflict not relationship conflict was significant in predicting a co-founder exit. This is surprising considering Vanaelst et al. 's (2006) case study which found relationship conflict caused co-founders exits, while task conflict could lead to increased venture performance. This finding is important as it challenges one of the implicit assumptions in the marriage metaphor: that team divorce will occur due to high levels of relationship conflict. Further, our paper extends prior work that finds a connection between relationship conflict and negative affect (Breugst & Shepherd, 2017; Foo, Uy, & Baron, 2009) and finds those two variables lead to detrimental consequences for ventures (Ensley & Hmieleski, 2005; Ensley et al., 2002). We extend these findings by showing that unlike a marriage, the level of relationship conflict does not predict the detrimental outcome of a co-founder exit, as it does divorce.

Further, there is an implicit connection between relationship conflict and negative affect—often called *affective conflict* (e.g. Amason, 1996), and turnover, with affective conflict thought to increase exit intentions (Shaukat, Yousaf, & Sanders, 2017). Surprisingly, our findings do not support this implicit connection, rather we find an explicit connection between positive affect, task conflict and co-founder exits. This calls into question some assumptions about the nature of relationship and task conflict in the founding team setting, suggesting that the marriage metaphor might be misplaced in this context, as relationship conflict is less significant than task conflict in predicting co-founder exits. Considering these findings, we question the notion of "affective conflict" in the founding team context. Considering that positive affect is the main variable of interest in a conflict episode that predicts a co-founder exit, perhaps we need to redefine affective conflict to encapsulate the full range of positive to negative affect, not just as a synonym for negative affect in a conflict episode. Hence, taking together the importance of positive affect and task conflict for co-founder conflict, we find significant deviations from research on marital conflict (Gottman et al., 1998). Future research could benefit from utilising these dynamic affective measurements to understand how positive and negative affect fluctuate throughout founding team conflict episodes, adopting a process lens to understand how affect and conflict type go on to affect the venture in the long run.

Second, we contribute to literature on *entrepreneurial affect*. Our findings reveal

that contrary to findings in marriage research, negative affect at the individual and team level was not predictive of a co-founder exit, or a founding team separating. Yet, we find a more complex relationship between positive affect and co-founder exit. Notably, we are not suggesting that all co-founders who express positive affect will eventually leave their venture. Rather, by taking into account the context and rationale for positive affect in each team interaction, it became evident that certain types of positive affect significantly related to a co-founder exit, e.g. masked positivity. These findings are particularly relevant when we consider 'masked positivity' in line with wider affective theories. In line with one study, Baron, Tang, and Hmieleski (2011) finds that while positive affect is related to many beneficial entrepreneurial outcomes, there are upper bounds whereby further increases in positive affect are associated with declines in firm performance. Hence, researchers show that too much positive affect does not uniformly have beneficial consequences: seminal studies investigating the sadder-but-wiser hypothesis (that some individuals may be sadder and thus wiser; Alloy & Ahrens, 1987). They show that individuals with more negative affect may be less likely to minimize the possibility of negative events (Alloy & Ahrens, 1987). Taking this into consideration, we posit that founders with lower amounts of masked positivity might accept a more realistic view of both their venture, and the problems within their founding team. This is important and disruptive to previous theorising that suggests negative affect triggered by the entrepreneurial team lead co-founders to withdraw from the team and eventually exit (Breugst & Shepherd, 2017, p. 26). Hence, negative affect is often conceptualised as a 'villain' causing team conflict and a co-founder exit, yet contrary to this we find positive affect is an important predictor variable. Future work would benefit from investigating the role of masked positivity in team conflict and in the co-founder exit process. Taken together, we posit that positive affect cannot simply be perceived as beneficial or detrimental, but rather masked positivity is a symptom of psychological inflexibility and will increase the likelihood of a co-founder exit.

Finally, our study has important contributions for literature on *co-founder exits*. Namely, while the majority of extant research on co-founder exits investigates the consequences of an exit (for example investigating the deleterious consequences for remaining team members due to resource loss; Bamford et al., 2006), very few studies have investigated that affective dynamics that predict a co-founder exit. This is essential in qualifying the marriage metaphor as a potentially appropriate framework for discussing the co-founder relationship. Our findings call into question the taken for granted assumptions about co-founder exits in the marriage metaphor by finding some distinctive differences between marriages and ventures. First, while most entrepreneurial exit literature views exiting as synonymous with venture failure (Jenkins et al., 2014), and therefore assume that a co-founder will exit due to a relationship breakdown (like in a marriage), we detail an important distinction. Namely, unlike marriages, not all ventures are founded with the aim of "until death do us part", some ventures are created with an exit route in mind, like harvesting capital (Wennberg et al., 2010). With this in mind, it makes sense why negative affect is not the most important variable in predicting a co-founder exit, as is in marriage. Further, while marriages are

started due to the quality of a relationship, ventures are often started due to co-founder's having diverse skills and experiences (Vanaelst et al., 2006). Hence, the role of relationship conflict in regards to predicting a co-founder exit has been potentially overstated, as we found in our study. Yet, this is not to stay that affective dynamics are not important in predicting a co-founder exit. As we found, they can be. When positive affect is related to venture performance, no co-founders exited their venture within 12 months. Yet, when it was unrelated to venture performance, or a strong co-founder relationship, all co-founders exited their venture within 12 months. This has important implications for co-founder exit literature. Namely, we are suggesting that while there are differences between the marriage dynamic and the co-founder dynamic, there are some parallels. Specifically, while therapy for co-founders that directly applies marriage principals does not make sense in light of our findings (e.g. focusing on limiting negative affect and relationship conflict), we suggest that general communication development in regards to having honest conversations about real issues is likely important in avoiding overstated positive affect, and an increased chance of a co-founder exit, if a team is wanting to avoid that.

5.7 LIMITATIONS AND FUTURE RESEARCH

There are three main limitations and avenues for future research resulting from our study. The first limitation of our study is due to generalisability due to the nature of our sample and timescale of this study. Future research should create a sample that is representative of both early and later stage ventures as venture life cycle phases may significantly impact the timing of a co-founder exit. Further, while we tracked teams for 12 months, future research would benefit from following teams over a longer period of time to understand if affective dynamics evolve and change over time, and if those changes can further predict a co-founder exit. This is important as marriage researchers find that different affective dynamics predict divorce early in the marriage and late in a marriage (Gottman & Levenson, 2000). Hence, perhaps teams with negative affect do experience a co-founder exit, but across a longer time frame. Given this, we cannot exclude that the findings of other research could still be supported. Considering a wider sample, future research would benefit from understanding how wider demographic diversity impacts co-founder exits through an affective lens. Namely, how does gender, experience, industry, age and education impact the affective dynamics that lead to a co-founder exit?

Second, two forms of measurements present a limitation of this study. The first is the use of Jehn's (1995) task and relationship conflict measurement. There are a number of reservations about the use of this scale (Korsgaard et al., 2008), regardless of how widely used it is in entrepreneurial research (e.g. Breugst & Shepherd, 2017; Ensley & Hmielski, 2005). Hence, on the one hand by using this scale we enhance the comparability of our research with extant literature. On the other hand, future research would benefit from applying different scales that measure process conflict (Jehn, 1997), and other, alternative measures of

conflict (e.g. Todorova et al., 2014) to better understand the relationship between different forms of conflict and affective dynamics. Second, while we measured dynamic, objective and continuous affect in team interactions, further research would benefit from utilising measures of activation to not only measure what type of affect is present, but how strong the affect is (Foo, Uy, & Murnieks, 2015). This would undoubtedly shed new light on the role of within-person affective dynamics.

Third, the procedure of conflict elicitation limits this study. While we adapted widely used conflict elicitation procedure from marriage research (i.e. Levenson & Gottman, 1983), the facilitation of naturalistic interactions in a research setting is difficult. We followed common mitigation strategies such as using discrete cameras, and having the researcher leave the room (as in Levenson & Gottman, 1983). Many teams also noted the naturalistic dynamic in the data collection process, yet future research could benefit from collecting data in an even less obtrusive way. For example, utilising virtual meeting footage, or retrofit cameras in an incredibly subtle way in specifically designed research offices (as in Gottman & Schwartz, 2018).

5.8 CONCLUSION

This article is the first empirical investigation into the utility of applying the commonly used marriage metaphor to describe the co-founder relationship and co-founder exits. We highlight the nuance in the relationship between positive and negative affect, task and relationship conflict, and co-founder exits. Contrary to existing research, negative affect and relationship conflict were not significant with regards to co-founder exits, whereas both task conflict and positive affect were. Specifically, the more positive affect and task conflict present in co-founding teams, the more likely the team was to break up within twelve months. This pattern of findings shows that the interactions and affective dynamics within founding teams play an important role in increasing the likelihood of a co-founder exit. Thus, by introducing a new variable of interest – masked positivity – we help explain the surprising interplay of entrepreneurial affect, conflict and co-founder exits.

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6 | DISCUSSION

In this chapter, I summarise and discuss the articles featured in this thesis. First, I briefly summarise each article. Second, I discuss the articles as a collective body of work by presenting a theoretical framework (*figure 10*). Third, I discuss how these findings relate to literature on co-founder exits, founding teams, conflict and affect. Finally, I conclude this chapter by discussing the limitations of this thesis, and recommendations for future research.

In this thesis I started with the following research question as a guide: *How do affective dynamics and conflict within founding team interactions impact co-founder exits in the long run?* I wrote three articles in pursuit of answering this question. I make two core contributions: I draw attention to the differences between marital relationships and co-founder relationships, and I highlight that affect should be conceptualised and handled in a different way.

6.1 Article summaries

In the first article, we adopt a process lens to investigate valence and activation throughout founding team conflict episodes. We explore assumptions about the presence of negative and positive affect throughout team task and relationship conflict episodes: management researchers detail that the presence of negative affect depends on the *conflict type*, assuming that high levels of negative affect are present in relationship conflict (Pelled, Eisenhardt, & Xin, 1999), but absent in task and process conflict (Amason, 1996). We show that the affective dynamics at play within a founding team conflict episode fluctuate separately to the type of conflict, e.g., positive affect was sometimes present in relationship conflict, and negative affect was often present in process or task conflict. We introduce a typology of activated affective responses in conflict, which details how affect and valence interact to impact conflict episodes.

Building on the first article, the second article also investigates the affective dynamics at play within founding team interactions. This article built upon the definitions and patterns described in article one (conflict, affect and activation), and explored how these variables underpin the mechanisms of co-founder exits. The findings of this article show that the antecedents of team shared affect and shared cognition that are at play before a co-founder exit are important in impacting the founders who leave, and those who remain in the long run. In this paper, we introduce a model of affective and cognitive dynamics in the co-founder exit process. We find empirical support to show that patterns of team affect and cognition impact interaction spirals which influence levels of conflict, the speed of exit, and commitment to the venture.

The third article was designed to build upon findings from articles one and two.

In this article we took a broader perspective by integrating literature and findings specifically from the marriage metaphor, to empirically investigate if the context of entrepreneurship is similar to distinct to the context of marital relationships. Building upon entrepreneurial affective research and conflict theories we test the assumption that relationship conflict and negative affect will increase the likelihood of a co-founder "divorce". Interestingly, we find that counter to expectations these variables were not significant in predicting a co-founder exit, as they were in the marital context. Yet, on the contrary, both positive affect and task conflict were significant at the individual and team level in predicting a co-founder exit and team separation. Hence, in this third paper, we weave together insights and findings from all three papers and answer the research question set out in the introduction. Ultimately, we find evidence that the contexts of marriage and entrepreneurship have significant differences, which suggests we should remain critical when disseminating relationship advice to co-founders that was designed for spousal relationships.

I bring together the core contributions and associated propositions (*section 5.2*) into one theoretical model *figure 10*. This theoretical model presents the salient findings from articles one, two, and three. I suggest how affective dynamics evolve and change across the entrepreneurial journey. Just as affective dynamics emerge throughout any interpersonal interaction, the affective dynamics at play within founding teams start to take place as founding teams solidify. The affective dynamics fluctuate from activated and inactivated negative affect, to activated and inactivated neutral or positive affect (*article one*). As the teams work together more and more, they enter into one of three interaction spirals, depending on their level of shared affect and shared cognition (*article two*). These interaction spirals are "an enduring, deviation-amplifying relationship" (Shepherd, Patzelt, & Haynie, 2010 p.60). These interaction spirals show the dynamic development in the relationship between affect and cognition (Shepherd et al., 2010; Walter & Bruch, 2008). Different interaction spirals impact founders and their potential desire to exit their venture differently (*article two*). Over time, founders experience more or less positive and negative affect throughout their interactions (*article three*), which impacts the outcomes of the venture, specifically how likely they are to experience a team separation (*article three*).

6.2 Core contributions from the theoretical model

The overarching aim of this thesis was to understand how affective dynamics and conflict within founding team interactions impact co-founder exits in the long run. At the outset, it became evident that there is an assumption that affective dynamics impacting marital relationships (e.g. high levels of negative affect) and the conflict dynamics in marriage (e.g. high levels of relationship conflict) can be directly applied within entrepreneurship to shed light on avoiding co-founder exits (Perel, 2020). Given the significant knowledge built using novel, dynamic measures in marital research (see Gottman & Levenson, 1983), it was pertinent to adapt these methods to test if these important variables in marital relationships hold in co-founder relationships and to understand how affective dynamics and

conflict impact co-founder exits over time.

6.2.1 Proposition one: There are significant differences between the marital context and the entrepreneurship context

A core contribution of this thesis is to emphasise the significant differences between the marital context and the entrepreneurship context. Previous entrepreneurship scholarship has examined how different relational metaphors increase our understanding of entrepreneurship (e.g. Cardon et al., 2005); for example, the metaphor of parenting can offer a fruitful comparison that better resonates with entrepreneurs than current theory (Cardon et al., 2005). While the relational metaphor of marriage may intuitively connect with founders (e.g. Holson, 2015), I propose that critical investigation should occur when integrating findings from marital research into entrepreneurial research due to the contextual differences. There are obvious contextual differences between marital relationships and co-founder relationships: most marriages start with the desire to be in the relationship for life, whereas founders often start ventures with an exit strategy in mind (Wennberg et al., 2010). This likely has important implications for the level of emotional investment in spouses versus co-founders. Further, there is an obvious disparity in the physical intimacy expected from marriage than a venture, and the lack of sharing children or some legal responsibilities. These are all important considerations where we use the metaphor of marriage to describe co-founder relationships. Nevertheless, the most significant difference is in positive affect, e.g. positive affect leads to reduced divorce rates in marriage but increases 'divorce' rates in founding teams.

6.2.2 Proposition two: Negative affect is the main variable of interest in martial separation, but positive affect is in founding teams

While negative affect is the main variable of interest in marriage (Gottman & Levenson, 1992; Gottman, 1994), it is not the main variable of interest in founding teams. Rather a type of positive affect (*paper one, paper three*), which we called 'masked positivity', is a significant predictor variable within the context of co-founder exits. This is a significant difference, and one not currently disseminated to founders. Namely, current relationship therapists note co-founders should foster positivity and focus on the positive (e.g. Perel, 2020), yet we propose that some co-founders who emote significant levels of positive affect were unable to accept, process and express negative emotions in their team interactions, which in turn increased their likelihood of exiting the venture. In marriage, couples are advised to minimise the negative and dial up the positive (Fowler & Dillow, 2011), this advice runs counter to existing organisational literature that finds coping is often associated with more negative emotions (Patzelt & Shepherd, 2011). Hence the contextual differences in the role of positive and negative affect across both domains is significant and warrants further research.

Over time, cofounders interact with each other in repetitive ways, this leads to interaction spirals. In interaction spirals, interactions typically either have more (a) activated or inactivated negative affect, or (b) activated or inactivated positive affect

Genuine venture success significantly buffers negative interaction spirals from leading to a cofounder exit, close relationships moderately buffer external events from leading to a cofounder exit. Team dynamics that lack affective authenticity, e.g. masking, increases likelihood of cofounder exit and relationship breakdown

2. Affective dynamics become entrenched

4. External and internal events buffer or exaggerate team dynamics
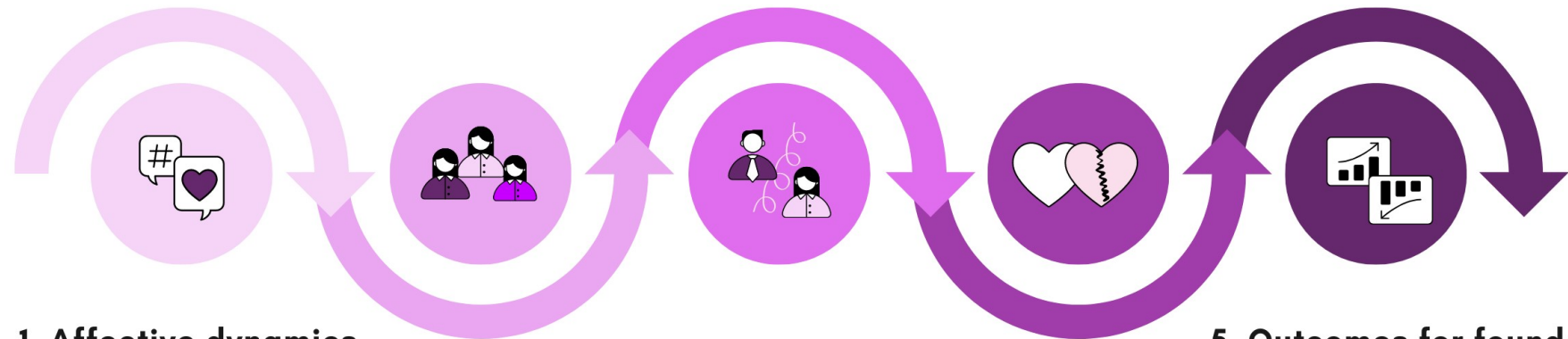
1. Affective dynamics emerge

As founding teams solidify, affective dynamics emerge and fluctuate throughout all team interactions

3. Interaction spirals shape founder perceptions

Shared levels of affect and cognition shape founders perceptions of the venture and their perceived value in the team, this impacts the level of conflict and a founders commitment to the venture

5. Outcomes for founders and ventures

Cofounder exits can be detrimental or beneficial for venture and founders, depending on the affective antecedents. If full team remains, interaction spirals continue to evolve

Figure 10: The theoretical model of affective processes in founding teams

6.2.3 Proposition three: Affect is a dynamic, ever-changing phenomenon that needs dynamic measurements

We evidence the dynamic, fluctuating nature of affect (*article one, article two*). We highlight the need for a new conceptual understanding of affect, and new operationalised methods to study affect in a dynamic and nuanced way. In article one, we discussed how affect and relationship/task conflict have typically been conflated and treated as one variable. We propose that part of the reason relationship conflict is conceptualised as synonymous with negative affect is because of the operationalisation methods. Reliance on static self-report measures (Cronin & Bezrukova, 2019) means that our concept of affect throughout conflict and interactions remains relatively static, and is typically focused on negative affect as it is assumed to be a mediator in the conflict process (Greer & Jehn, 2007). This is problematic as there is a lack of theoretical justification as to why negative affect, as opposed to positive or neutral affect, is important in research (Todorova et al., 2014). Hence we empirically show that affect is a dynamic entity, evolving and changing throughout interactions. Namely, affect is not a static phenomenon that can be captured accurately in retrospect, but rather we need to measure it at the team level (*paper two, three*), using process methodologies (*paper one, two*), measuring both valence and affect (*paper one, two*), and apply objective measures (*paper one, two, three*).

The theoretical model and propositions have important implications for theory on co-founder exits, entrepreneurial affect, conflict theories and found team literature. I detail these now.

6.2.4 Contributions to theory on co-founder exits

This thesis has an important implication for co-founder exit theory. First, we evidence how the affective and cognitive dynamics within co-founder exits—like affective heterogeneity and shared cognition—significantly predict (*article three*) and impact (*article two*) co-founder exits. We find that affective heterogeneity, and other affective dynamics significantly impact the affective state of the exiting founder (*article two*). We show that low levels of shared affect impacts the relationships within, and external to, the venture following a co-founder exit. By adopting a process lens, and a longitudinal, mixed-methods approach, our findings highlight the role of affect throughout the co-founder exit process. We find that both affective heterogeneity and high levels of masked positivity may lead to co-founder exits (*article three*), and be of detriment to teams if they experience a co-founder exit (*article two*). This contributes to our knowledge of co-founder exit theory by adding nuance to what we know is a highly affective part of entrepreneurship (Shepherd, 2003). By incorporating team process theories and affective theories, we emphasise the affective nature of co-founder exits, and explain how affective phenomena can impact team exits in the long run.

6.2.5 Contributions to theories on entrepreneurial affect

This thesis has three main contributions to the literature on affect. First, our findings highlight activation as a crucial affective variable in founding team processes

like conflict (*paper one*). Specifically, we introduce the typology of activated affective responses throughout founding team conflict to illustrate the critical interaction between affect and activation. By introducing the concept of activated affect, we hope that future scholars will further investigate how different types of activated affect play out in the founder's journey. By pivoting the focus of the investigation to activated affect throughout founding team processes, we believe some core theories with mixed empirical findings will be unpicked, for example, the mixed empirical and theoretical findings from meta-analyses about team conflict (e.g. DeDreu & Weingart, 2003; de Wit, Greer & Jehn, 2012). Other scholars also posit that activation is an important variable in understanding team processes (e.g. Todorova et al., 2014), hence we hope with the technological developments that now enable the collection of physiological activation data, more scholars will begin to include activation as a core affective variable of interest when studying founding teams.

Second, we extend entrepreneurial affect theory by directly comparing the affective outcomes following a co-founder exits across different teams (*article two*). Our findings suggest that instead of seeing negative affect as "bad" for entrepreneurial performance, and positive affect as "good" for entrepreneurial performance, it is the dynamic interactions within teams that can lead to detrimental consequences following an exit, for example the expression of masked positivity (*article three*), and high levels of affective heterogeneity (*article two*).

Third, we find that contrary to expectations, negative affect did not predict founding team separation as hypothesised. Given the literature that suggests negative affect is related to team conflict and increases the likelihood of co-founder exit (Breugst & Shepherd, 2017) and the marital research that shows the same (Carrère & Gottman, 1999), we were surprised to find that when quantitatively assessed for the first time in entrepreneurial literature, positive affect was a key variable that predicted co-founder exits and team separation. We propose that founders who express lower amounts of positive affect may be more realistic about the shortcomings of their venture and team. Previous scholars detail that "*it would be interesting to investigate whether negative affect triggered by the entrepreneurial team signals to entrepreneurs that their team is not functioning well, leading them to withdraw from the team and eventually exit*" (Breugst & Shepherd, 2017 p. 26). We propose that founders who emote a wide range of affect throughout their interactions may be better at handling different types of conflict and more skilled at having psychological flexibility to deal with challenging issues. For example, a co-founder in *article three* complained about a poor relationship with her co-founder, poor venture performance, and high conflict, yet throughout their interactions, she exhibited very high positive affect. In a follow-up interview, she detailed how there was "conflict under the surface". Considering this, our data shows that co-founders who can address the root of a problem and create a solution even if that involves interactions with high levels of negative affect may be better off in the long run (*article one, two, three*).

Yet, that is not to paint positive affect as the "villain". We are not suggesting that all co-founders who express positive affect will go on to exit their venture. Instead, when the positive affect expressed was unexplained and used as a mask (which we coded as masked positivity in our data), co-founders were more likely to exit. Given this finding, we suggest that while positive affect may be beneficial for entrepreneurial outcomes, there are upper bounds where positive affect has a negative influence (Baron, Tang, & Hmieleski, 2011). Considering this, it does not make sense to coach co-founders with affective tools developed from marriage therapy (e.g. focusing on limiting negative affect).

6.2.6 Contributions for conflict theory

This thesis presents two core contributions to theories of conflict. First, we present an alternative theoretical explanation for why some episodes of task and process conflict can be beneficial (Amason, 1996), while others are detrimental (Jiang, Zhang, & Tjosvold, 2012) (*article one*). We observed that the activated affect exhibited by founders impacted the conflict intensity and likelihood of a resolution (*article one*). We found that an activated negative affective response was shown throughout all types of conflict (process, task and relationship). Hence, instead of conceptualising task and process conflict as void of negative affect rather it may be more accurate to conceptualise conflict according to the affective styles at play throughout a conflict episode. This pivot in focus in conflict theory calls into question the conceptualisation of conflict in teams, as teams are advised to focus on task and process conflict instead of relationship conflict to avoid negative affect (Jehn & Mannix, 2001), whereas we suggest that paying more attention to the affective styles present throughout conflict episodes may reduce conflict intensity and increase the chance of resolving (*article one*).

Second, we reconsider the role of relationship conflict in the lead up to a co-founder exit. *Article two* evidences how both teams that report a high level of conflict (e.g. 5 out of 5 on a Likert scale), and a very low level of conflict (e.g. 1 out of 5 on a Likert scale), experienced a co-founder exit. Furthermore, we evidence how the damage caused by the co-founder's exit was not in direct correlation to the level of relationship conflict reported. *Article three* further causes us to re-evaluate the role of relationship conflict in team separation by finding that task conflict, not relationship conflict is predictive of an eventual co-founder exit and team separation. This is important considering prior literature states that relationship conflict can lead to negative affect and "departure by the offended team members" (Ensley, Pearson, & Amason, 2002, p. 366), yet our findings run counter to other co-founder conflict and exit literature. For example, Vanaelst et al. (2006) case study found that relationship conflict caused co-founders to exit, while task conflict could lead to increased venture performance. Our findings cause us to reconsider the role of task and relationship conflict, and position activated affect (*article one*) and affective dynamics (*article two, three*) as leading variables that distinguish between teams that do and do not experience a co-founder exit. Hence, we extend previous entrepreneurial conflict literature which finds affective conflict is thought to increase exit intentions (Shaukat, Yousaf, & Sanders, 2017). We suggest a need to redefine 'affective conflict' to encapsulate the full

range of positive to negative affect, not just use it as a synonym for negative affect in a conflict episode.

6.2.7 Contributions for theories on founding teams

Finally, we identify structural differences between founding teams and marriages, and further evidence the unique context of founding teams. Entrepreneurial teams literature is influenced by numerous fields, for example, the considerable and important work done in organisational behaviour and psychology. But in this thesis, we evidence that although some ideas and metaphors may intuitively help us to understand the dynamics of a founding team more (e.g. the marriage and divorce metaphor), there are considerable differences that make founding teams an important, rich and valuable context to study. Hence, placing founding teams at the centre of this thesis was an important decision and guided our sampling decisions, for example, delimited our sample to founding teams as opposed to organisational teams or student teams. Building on the findings of this thesis, we evidence that founding teams are a uniquely important context, and for that reason as scholars we should not take for granted that theories that apply in other contexts will stand true within entrepreneurship.

6.3 Implications for practice

Along with theoretical implications, this work has four core implications for practice. First, we suggest founders themselves start to monitor their own stress responses throughout founding team interactions. This could look like utilising a smartwatch that prompts you to take deep breaths when you become physiologically activated (stressed), or asking yourself "why am I pretending to be positive right now, even though I feel negative?" (article three). This is a difficult skill to master, for example when we asked founders to rate how they felt throughout an interaction, it was often at odds with their physiological activation, this tells us we may need to practice better understanding our emotions in the long run. Especially so within entrepreneurship where founders are often told to "fake it till you make it" (Ivana, 2017), yet our studies suggest that using positive affect to mask one's true feelings will detriment the venture in the long run.

Figure 11: Practical implications for founders, exercising emotional awareness could strengthen teams

Second, while prior researchers suggest that when relationship conflict emerges, avoiding it may help to increase team functioning (De Dreu & Van Vianen, 2001), we posit that avoiding conflict, which can enhance physiological stress, will not benefit the team. Rather, founders should learn to embrace agile affective responses that keep them out of fight or flight mode (*article one*) and help them to resolve the conflict at hand. Specifically, reducing conflict redirection and spiralling (*article one*), will likely de-escalate conflict and reduce the physiological strain from the conflict in founding teams.

Third, being "on the same page" in regards to what your co-founders *think* about the venture, and how they *feel* about the venture is incredibly important for reducing the potential detriment if a co-founder does exit. This means that keeping an open mind throughout interactions, and regularly checking in with your co-founders is incredibly important to foster shared emotions and shared thoughts (*article two*).

Fourth, while some researchers propose that entrepreneurial exits are based on a degree of rationality and analysis (Wennberg & DeTienne, 2014), we found instances of co-founder exits that were made in the heat of the moment and lacked rationality or analysis (*article two*). This was almost always after the co-founder had experienced a high level of active negative affect, and low shared emotions with their other team members. Unfortunately, in these instances, the exiting co-founder did not feel supported to maintain a relationship and therefore the venture experienced a high degree of knowledge loss. This indicates the importance of developing and maintaining communication tools designed to foster shared emotions and shared thoughts. This may not prevent a co-founder from exiting, but it will likely minimize knowledge loss and loss of customers.

Finally, we suggest a high level of caution to practitioners and startup coaches in applying marriage therapy techniques to the startup context. Such that applying

these marriage principles does not make sense in light of our findings (*article three*), and rather than being encouraged to limit negative affect and relationship conflict (e.g. as in marriage therapy; Gottman et al., 2015) co-founders should be wary of being perpetually positive even despite serious challenges. Rather, focusing on tailored tools for co-founders specifically would be a better approach, tools that improve communication, improve co-founders' ability to have honest conversations and talk about real issues without having to "fake it till you make it", and only show positive emotions.

6.4 Future research

Here I identify the three most important and pressing avenues for future research. First, just as founders have to innovate and respond to new technological developments in the market, entrepreneurship researchers currently face the opportunity to harness new methodological innovations to study affect (valence *and* activation) in founders and founding teams in a new way. For example, the use of artificial intelligence algorithms can be employed to monitor changes in valence (facial expression analysis) and activation (biometric data) to develop a comprehensive understanding of what parts of the entrepreneurial process are highly affective. As this technology advances and the algorithms become more sophisticated, future research will be better placed to use even more accurate facial expression analysis to measure dynamic changes in affect over long periods. Utilising this new technology will yield fruitful insights about the role of affect in entrepreneurship.

Second, I see the application of the affective lens to entrepreneurial processes that are highly affective (like co-founder exits) as an important step in progressing future research. For example, applying theories of shared affect, affective heterogeneity, and affective dynamics to founding team conflict, equity split negotiations, co-founder exits, pitching, and negotiations with venture capitalists may offer important new theoretical and practical insights into these emotional stages of entrepreneurship. Questions are outstanding: how does affective heterogeneity change after a new co-founder has been recruited? How does affective heterogeneity relate to venture performance in the long run? Additionally, we did not investigate how the relationship with external stakeholders impacted team affective dynamics and co-founder exits. A promising topic for future research would be to explore how affective interactions with the board shape exit intentions, types of exits and entrepreneurial outcomes. Namely, if a co-founder feels hostility or negative affect from the board, how will that impact the speed, timing and impact of an exit?

Finally, we introduce a new variable that we deem central to team functioning and co-founder exits: masked positivity. Given that this is a new variable, future work should adopt an approach to investigate the impact of masked positivity in founding teams on large-scale samples. Namely, future studies could develop a coding scheme specifically for identifying masked positivity and investigate how that variable relates to other entrepreneurial outcomes like trust, cohesion and

exit intentions across a large sample. How does masked positivity impact the relationship with external stakeholders like ventures boards and customers? Is there ever a context where masked positivity is an adaptive, positive affective response? Are founders aware when they use positivity to mask difficult challenges or true, negative emotions?

6.5 Limitations

This PhD thesis adopted an explorative approach that enabled the integration of novel methodologies to explore the impact of affect and conflict on founding teams with detailed, rich, process data. Yet, the contributions set out must be viewed in light of three core limitations: conflict elicitation, sample, and data quality.

First, each study used data collected through a procedure of conflict elicitation. We adopted best practices for conflict elicitation used in seminal psychology research (e.g. Levenson & Gottman, 1983). Nevertheless, the facilitation of naturalistic interaction in a research setting is difficult. We used discrete cameras and had the facilitator leave the room during the conflict episode (as in Levenson & Gottman, 1983). Several teams did have intense conflict episodes, yet future research could benefit from using even less obtrusive physiological measurements, like biometric rings, to further foster naturalistic interactions. Further, Gottman and Schwartz (2018) designed an apartment fitted with subtle cameras solely to make participants feel comfortable in a naturalistic setting. Hence, researchers could use tailor-made spaces to collect the most naturalistic affective data possible, using virtual meeting footage or an incubator space set up with cameras and sensors for naturalistic data collection.

Second, as with all case-based research, the sample size may limit the generalisability of our findings. While we focused on a relatively small sample which enabled the collection of very rich and nuanced data, future research could test the models put forth in the thesis on large-scale data. Additionally, due to public health restrictions of face to face interactions, there were limitations on when we could do in-person data collection with full founding teams. This meant that we followed teams for mixed lengths over 12 to 24 months, yet future research could benefit from following a larger sample of teams over multiple years and capture data on a more regular basis, namely weekly, or even daily for a longer period to time to monitor the fluctuations in affective dynamics, shared affect and cognition in founding teams. It would be interesting to regularly capture data on teams in more developed ventures who were undertaking an Initial Public Offering, this way researchers could develop a more comprehensive understanding of the range of affective experiences throughout different venture stages when exits are potentially more consequential.

Additionally, while we incorporated both dyads and teams into our sample to ensure our results were relevant for a wide range of founding teams, some researchers consider dyads and teams to be fundamentally different (e.g. More-

land, 2010). Although we found no statistically significant differences between the dyads and teams (*article three*), further research could delve into specific differences between the affective process between dyads and larger teams. Finally, given the over-representation of men in entrepreneurship generally (Popescu, 2012), it made sense men were over-represented in our sample. Nevertheless considering gender was statistically significant as a control variable (*article three*). Future research could investigate the role of gender in affective processes and co-founder exits within founding teams.

Third, while we tried to limit the noise created in the data collection process, gesticulation and speaking may have created artefacts in the data. Considering gesticulation, minor artefacts were likely created in the physiological data. While we control for this in the biometric analysis, the utilisation of more movement sensitive physiological sensors may improve biometric analysis (Lei, Sala, & Jasra, 2017). Nevertheless, this is an ongoing and unresolved challenge in current studies of activation. Further, while we utilised the same algorithms used in the latest entrepreneurship research (Warnick et al., 2021), nevertheless some artefacts were created in the data when participants spoke. Future researchers may begin to utilise online meeting data in the face of a more digital working world, this would increase the data quality of affective analysis with participants not moving and looking straight into their web camera, yet this would limit the collection of activation data as the participants would not be able to use remote biometric sensors, hence this was not appropriate for this thesis.

6.6 Conclusion

This thesis set out with the aim of investigating how affective dynamics and conflict within founding teams impact co-founder exits in the long run. We noticed how many founders in practice were turning to marriage therapy to improve their relationship, and empirically assessed the appropriateness of using the marriage and divorce metaphor in the entrepreneurial context for the first time. We found that affective dynamics are continuous and unrelated to the level of reported relationship and task conflict (*article one*), that patterns of group affect and group cognition impact the nature of team interaction spirals which in turn result in co-founder exits, and finally that the marriage metaphor does not hold up within the context of entrepreneurial co-founder relationship. Specifically, instead of relationship conflict and negative affect being the key predictor variables as is in marriage (Gottman & Levenson, 2000), task conflict and positive affect emerged as key variables of interest in the lead up to co-founder exits. Hence, this PhD contributes significantly to the literature on entrepreneurial affect, entrepreneurial exits and founding teams conflict by revising assumptions about negative affect and conflict in founding teams. Through the use of novel methodologies, I introduce novel insights about what impacts founding teams in the long run: how being on the "same page" with affect and cognition minimises the impact of a co-founder exit, and how 'masked positivity' increases the likelihood of a founding team separation. Taken together, we find that not all co-founder exits are enacted from a place of logical reasoning, but contrary to marriage, the co-founder

relationship is not for richer or better, for better for worse, but without consistent focus on clear and authentic communication, founding teams can get entrenched in negative interaction spirals leading to broken relationships, high conflict and low commitment.

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7 | APPENDIX

7.1   Paper four

Thomas, N., Lomberg, C. & Alkærsig, L. (Forthcoming). *Does Neurodiversity In Founding Teams Enhance Performance? Investigating A New Type Of Diversity In New Venture Teams.* Frontiers of Entrepreneurship Research (40), 2020.

DOES NEURODIVERSITY IN NEW VENTURE TEAMS ENHANCE PERFORMANCE?

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ABSTRACT

Recent entrepreneurship literature highlights the adaptive benefits of neurological differences for lone entrepreneurs. However, it is not known how neurological diversity plays out within new venture teams (NVT). This paper adopts a strengths-based lens to define neurodiversity and empirically test our neurodiversity model by analysing more than 5,452 Danish NVTs over a nine-year period. Our findings reveal that the inclusion of a neurodiverse founding member enhances team performance; this effect is enhanced for founders who have received treatment. This study contributes to entrepreneurship theory by empirically showing the adaptive benefits of multiple neurodiversity conditions and the positive benefits for founding teams composed of neurodiverse entrepreneurs.

INTRODUCTION

Recent literature has emphasized how essential mental health is for the 21st century entrepreneur, given the nature of the knowledge and information economy (Freeman, Staudenmaiser, Zisser & Andresen, 2018). It is well established how varying personal challenges such as unemployment (Block & Wanger, 2015), immigration (Hart & Acs, 2011), physical disability (Pagan & Malo, 2009), ADHD (Wiklund, Hatak, Patzelt, & Shepherd, 2018), bipolar disorder (Biasi et al, 2015) and Autism Spectrum Disorder (Baron-Cohen et al., 2009) can all lead to adaptive behaviour, conferring advantage for the lone 'underdog entrepreneur' (Miller & Le Breton-Miller, 2017).

Yet, these challenges are all 'person-centred'; i.e., they focus on the entrepreneur themselves, not their external environment or business. Importantly, it is recognised that teams start the majority of new ventures, and the success or failure of their entrepreneurial endeavour is often predicated on the synergy, performance and composition of their NVT (Klotz et al., 2014). While we have a good understanding about managing team personality differences (Klotz & Neubaum, 2015; Bell, 2007), diversity in knowledge and perspectives (Zhou, Vredenburgh, & Rogoff, 2013) and differences in functional speciality (Jackson, 1992), little is

known about the relationship between diversity in mental health and neurological conditions in NVTs and resultantly, new venture performance.

Our paper makes several important contributions to entrepreneurship theory. First, we introduce a new facet to NVT diversity not previously studied in entrepreneurship—neurodiversity—and conceptually extend the line of enquiry, in the nascent strength-based literature to include NVTs. We propose that not considering this aspect of diversity within a team context is an important oversight, considering Freeman et al's study, which found 72% of their sample of 242 entrepreneurs were affected by mental health concerns (2018). Hence, we add to entrepreneurship theory by extending knowledge on this new facet of diversity.

Second, empirical research has widely established the benefits of neurodiversity; Bipolar disorder has been associated with perseverance (Hayden et al., 2008), autism spectrum disorder with pattern identification and focus (Baron-Cohen et al., 2009), and ADHD has been found to be advantageous for entrepreneurial action (Wiklund, Yu, Tucker & Marino, 2017). It is logical that most empirical research has investigated the effects of neurodiversity in the context of the lone entrepreneur as entrepreneurs with ADHD typically enter entrepreneurship alone (Wiklund, Lomberg, Alkærsig & Miller, 2019). Regardless, this limits the generalisability of these findings beyond the lone entrepreneur, a deleterious oversight considering teams found most new ventures (Klotz & Neubaum, 2015). Thus, we extend the compelling understanding of the upside of neurodiversity for lone entrepreneurs by exploring the potential positive consequences of neurodiversity within NVTs. Resultantly, we provide important insights for the composition of founding teams.

Third, we propose a methodological approach that is not limited by fear of stigma surrounding neurodiversity (Stuart, 2004), or non-disclosure to self-report measures due to the fear of discrimination or altered perception (Yoshii, 2014). Using epidemiological data prevents the non-response bias frequently found in other mental-health studies (De Winter et al., 2005).

HYPTHESES DEVELOPMENT

Neurodiversity and adaptive benefits

Investigating NVT phenomena from a strengths-based approach requires a change in terminology, essential in diverging from a reductionist medical model (Freeman et al,. 2018). As such, instead of the term mental or neurological *disorder,* we use the term '*neurodiversity*' (Singer, 1999) henceforth in this paper. Neurodiversity is defined as "*the range of differences in individual brain function and behavioural traits, regarded as part of normal variation in the human population*" ("Neurodiversity", 2018).

We recognise that neurodiversity is subjectively problematic when symptoms of neurodiversity may deviate from standard behaviour. For example, Autism Spectrum Disorder (ASD) is diagnosed on the basis of social deficits, namely deviations from the average behaviour (Kapp, Gillespie-Lynch, Sharman & Hutman, 2012; Anckarsäter, 2010). This exemplifies that within some circumstances deviations from the average are considered a deficit, however within entrepreneurship significant deviations from average are often necessary in such a competitive environment. In fact, entrepreneurs are advised to improvise and to deviate from common practice (Baker & Nelson, 2005; Sarasvathy, 2001). Entrepreneurs aim to differentiate themselves from other participants in the market to generate novelty through non-standard innovation (Frese, Rousseau & Wiklund, 2014).

This difference highlights how the nuanced nature of distinguishing between deviations which lead to innovation, and deviations which lead to deficits. Freeman et al call neurodiversity *"a set of empowering traits and personal endowments,"* (Freeman et al., 2015: 25) that can result in benefits or conversely adverse consequences if not properly managed. Hence, we propose that the diagnosis of neurodiversity within team composition, i.e., the inclusion of a team member diagnosed with neurodiversity, will confer advantageous deviations for an NVT.

> *Hypothesis 1: New venture teams composed of individuals with a clinically diagnosed neurodiversity condition will exhibit higher performance than teams not featuring neurodiversity.*

Entrepreneurial Contagion

We hypothesise that the presence of neurodiverse founders will increase innovation and novelty in a NVT, even when accounting for treatment, due to their unique experiences and diverse thought processes. This is likely due to social contagion. For example, prior studies about human behaviour more generally have provided theoretical explanations and empirical support for "contagion effects" that occur "socially", i.e., via non-physical modes of contagion (cf., Alkærsig, Kensbock & Lomberg, 2018; Bauch & Galvani, 2013; Aral & Walker, 2012; Crandall, 1988). Hence, particularly for the consequences of neurodiversity behaviour expressed in visible ways, social contagion will likely occur in NVTs, even when controlling for treatment.

However, as bipolar patients score highly on novelty seeking behaviour (Evans et al 2005), this orientation to novel ideas and experiences, which is not 'treated' through CBT, will likely be contagious to other team members, thus enhancing team performance. We hypothesise that beyond the diagnosis of a neurodiversity condition, teams with a neurodiverse founder who is engaged in treatment will see enhanced performance, as they mitigate the negative consequences while still expressing beneficial differences.

> *Hypothesis Two: Teams with a founding member who has undergone treatment*

for a clinical condition will exhibit higher performance than teams without.

Team Size and Social Ties

The critical importance of having social networks for entrepreneurs has been widely established. Notably social ties provide essential human and social resources needed for competitive advantage (Florin, Lubatkin & Schulze, 2003). Additionally, research predicates that entrepreneurs are just like everyone else regarding their need for work related social support (Stephan, 2018), however unfortunately, they are likely to have fewer social supports (Rahim,1996; Tetrick et al., 2000). As the efficacy of romantic relationships in empowering lone entrepreneurs with ADHD has been proven (Wiklund et al., 2019), we can assume that interpersonal ties for neurodiverse individuals within a founding team are also highly relevant. Considering the sense of purpose and security a strong network can provide (Thoits, 2011), and the established benefit of stable romantic relationships for entrepreneurs with ADHD (Wiklund et al., 2019), social support from a NVT might help reduce the negative characteristics associated with neurodiversity. Lerner, Hunt and Verheul (2018) suggest that entrepreneurs with ADHD construct teams who may offset negative tendencies; we propose that due to increased social support - and thus social capital - larger NVTs will offer more support for neurodiverse team members, and as such, larger NVTs will outperform smaller teams.

Hypothesis Three: Larger new venture teams, which feature a founder(s) with neurodiversity, will exhibit higher performance than small new venture teams.

Birds of a Feather

Considering the benefits of being part of a socially integrated NVT (Foo, Sin & Yiong, 2006), we hypothesise that beyond the performance benefits of a larger team, having a higher percentage of the founding team with neurodiversity will also enhance performance. We propose this is because of the additional support garnered from having close relations with others who are also neurodiverse. The salubrious effects of friendship for those with neurodiverse conditions is widely stated (Mazurek, 2013), and even described as a "behavioural vaccine" (Sias & Barto, 2007). This is likened to the benefit of friendship for entrepreneurs (Francis & Sandberg, 2000).

We suggest that the social intensity of being part of a new venture may offer an opportunity for neurodiverse individuals to connect with similar friends. These friendships may help bolster a sense of identity, consistency, and stability (Campbell, Sedikides, Reeder, & Elliot, 2000; Luo & Klohnen, 2005). Thereby, moderating the negative effect of challenging social deficits, which resultantly will increase team performance.

Hypothesis Four: As the share of the founding team with neurodiversity increases, so too will the performance of the team.

METHOD

Sample	Epidemiological dataset comprising of (n= 5452 teams, 16,226 individuals) from 2004 to 2013.
DVs	NVT performance as measured by combined income of the team in a given year, transformed logarithmically.
IVs	**Addiction conditions:** Alcohol and substance addictions resulting in hospitalisation and recorded by ICD10 codes. **Mood conditions:** Clinically diagnosed schizophrenia, bipolar, depression and anxiety as classified by ICD10 codes, and medication as measured by ATC codes. **Neurological conditions:** ADHD as diagnosed with ICD10 codes Additional IVs: Treatment, Team Size, Neurodiversity Share
Controls	Corporation, Turnover, Exports, Expenses, Education, Networth, Venture Length, Firm size
Analysis	OLS, T-test with OLS co-efficients for hypothesis one

RESULTS & CONCLUSION

Our dependent variable, NVT performance, is an interval variable, and therefore we employ a standard ordinary least squares (OLS) approach. We test the data for normality using the Shapiro-Wilk test (Greene 2011), for heteroskedasticity with the Breusch-Pagan test (Wooldridge 2004), and multicollinearity by testing variance inflation. The tests show no issues with normality or multicollinearity, however the Breusch-Pagan test show that the error term is not constant. To correct for this, we employ the Huber-White estimator (robust standard errors) to correct for the heteroskedasticity issue.

Hypothesis one was tested only on a sample of the total population, omitting the founder teams in which one or more members has received medical treatment for a neurodiversity condition. Our analysis shows partial support for hypothesis one. Namely, we found that having individuals in a founding team with neurodiversity in either a mood or addictive condition leads to enhanced performance. As the specified model is linear, we can estimate the relative effect of the coefficients using the coefficients. The strongest positive effect was in founding teams with a member who has a mood condition, additionally, a positive effect was found with founding teams composed of a member with an addiction condition. To test whether the effects of mood and addiction conditions

Table Two - OLS regression explaining the effects of neurodiversity on NVT performance

	Model 1	Model 2	Model 3	Model 4
Addiction conditions	1,568**	2,085**	2,229**	1,931**
	[0,587]	[1,027]	[0,972]	[0,602]
Mood conditions	1,864***	1,399***	0,159***	1,555***
	[0,259]	[0,384]	[0,021]	[0,264]
Neurological conditions	-1,187	-1,136	-3,261***	-1,244
	[1,442]	[1,675]	[1,344]	[1,481]
Treatment		0,488**		
		[0,113]		
treatment##addiction		3,843**		
		[1,341]		
treatment##mood		1,549**		
		[0,592]		
treatment##neurological		-1,344***		
		[0,369]		
Team size	-0,865**	-0,849**	-1,033**	-0,522***
	[0,349]	[0,358]	[0,302]	[0,199]
Addiction conditions##team size=3			1,733	
			[2,070]	
Addiction conditions##team size=4			2,895**	
			[1,675]	
Addiction conditions##team size=5			5,744***	
			[2,083]	
Mood conditions##team size=3			-0,291***	
			[0.091]	
Mood conditions##team size=4			0,749**	
			[0,304]	
Mood conditions##team size=5			0,547**	
			[0.181]	
Neurological conditions##team size=3			-3,301***	
			[1.280]	
Neurological conditions##team size=4			-1,151**	
			[0,814]	
Neurological conditions##team size=5			-1,417	
			[1.500]	
Neurodiversity share				2,880***
				[0,300]
Corporation	-0,816***	-0,909***	-0,909***	-0,819***
	[0,266]	[0,286]	[0,286]	[0,256]
Turnover	0,051*	0,054*	0,054*	0,061*
	[0,030]	[0,031]	[0,031]	[0,035]
Exports	-0,057*	-0,053	-0,054	-0,057*
	[0,034]	[0,036]	[0,036]	[0,033]
Expenses	0,003	0,004	0,004	0,003
	[0,014]	[0,015]	[0,015]	[0,012]
Education	0,407***	0,415***	0,417***	0,407***
	[0,043]	[0,046]	[0,046]	[0,043]
Networth	0,017	0,016	0,016	0,017
	[0,013]	[0,014]	[0,014]	[0,013]
Venture length	-0,048**	-0,059**	-0,059**	-0,048**
	[0,023]	[0,025]	[0,025]	[0,023]
Firm size	0,092**	0,102**	0,101***	0,092**
	[0,039]	[0,041]	[0,041]	[0,039]
Constant	-78,945	-67,812	-65,736	-69,421
	[63,799]	[67,605]	[67,604]	[66,450]
R2	0,296	0,300	0,301	0,293
Pseudo LL	-16621.23	-15152.96	-15149.79	-15432.12
No of Obs	4.890	5.452	5.452	5.452

* p<0.1, ** p<0.05, *** p<0.01

are different, we test the coefficients of the OLS regression for mood conditions and addiction conditions using a t-test. The positive effect of mood condition was tested to be significantly higher than that of addiction condition, hence indicating a stronger effect. Interestingly, no effect was found in founding teams who included a member with ADHD. This is likely due to the sample used is restricted to only identify diagnosed, and not treated, individuals. In our sample, very few neurological cases exist where the individual is diagnosed, but not medicated.

To test for hypothesis two, the full population was sampled as shown in *Model 2*. This hypothesis is partially supported, and we find a positive moderating effect of receiving medication on the relationship between addiction and mood conditions, and performance. Interestingly, the strongest positive moderating effect is seen for those with an addiction condition, with a significantly smaller, but still positively significant, effect for individuals with mood conditions. Thus, when considering medicated founders, those with an addiction condition benefit the most from medication, notably, founders with mood conditions benefit from medication too. Individuals with ADHD experience a significantly negative moderating effect, however again this is likely due to the skewed distribution of individuals receiving medical treatment compared to those who are only diagnosed, with the latter being few in number as previously mentioned.

In hypothesis three the full population was sampled to assess how the size of the founding team affects NVT performance, and how neurodiversity moderates this. Overall, we find that smaller teams in general tend to perform better when there are no members with a neurodiversity condition, as indicated by the significant negative coefficient of the un-interacted term. Interestingly, team size has a differing effect for each category of neurodiversity, as indicated by the interaction terms. Specifically, for those with an addiction condition, we see a positive relationship between team size and performance, with larger teams experiencing increasingly stronger performance for a size of 4 and 5 individuals. For founders with mood conditions, results indicate a curvilinear relation with teams consisting of 3 members performing worse than those with 2, but again larger teams with 4 or 5 individuals exhibiting stronger performance. The potential curvilinear relation was tested by including the squared and cubed term of team size; however, this did not produce any meaningful results for the main effect and could not be confirmed. Interestingly, this hypothesis is not supported when considering founders with neurological conditions. We find an overall negative significant effect for team size with the inclusion of a founder with ADHD for teams with 3 or 4 individuals, when compared to teams with 2 individuals. This indicates that increasing team size does not result in enhanced performance for founders with ADHD, but rather that such founders perform better within a smaller team.

Finally, regarding hypothesis four, we analyse the full population to examine the effects of team composition on performance. Specifically, we examine how the proportion of individuals with a neurodiversity condition within a founding team affect performance. We find a strong positive, significant effect of the share

of individuals with a neurodiversity condition on performance, confirming the hypothesis. We tested a diversity index in place of using the proportion of individuals with a condition, however due to the generally small team size and low within-team variety of neurodiversity conditions, this did not produce meaningful results and was discarded.

This study extends beyond the prediction that the inclusion of neurodiversity in NVT composition can enhance performance, and adds empirical weight to the strengths-based neurodiversity lens for at least two reasons. First, this highlights the importance of consciously assessing neurodiversity in team composition, just as the combination of skills, knowledge and abilities are overtly considered. Further, we demonstrate that NVTs can be composed in such a way that maximises the adaptive benefits of neurodiverse founders. Namely, by increasing the share of neurodiverse founders, and by having a founding team between three to five people, performance for founders with a mood or addiction condition will likely be enhanced. Thirdly, these findings highlight the need to test assumptions of the positive effects of neurodiversity beyond just ADHD, showing that each category of neurodiversity responds differently within the context of NVTs.

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7.2   Paper five

The Opaque-Side Of Entrepreneurship: Some Founders Trade Substances for Entrepreneurship Addiction

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ABSTRACT

We examine substance addiction as a core antecedent in the development of entrepreneurship addiction, which is the compulsive need to engage in entrepreneurship. We draw on psychological addiction literature to expand the lens applied to understanding entrepreneurship addiction. We expand beyond studying behavioural addictions, such as gaming or internet use, to focus on theories of behavioural and substance addictions alike. Through the use of a mixed-method approach, we team both epidemiological data from more than 48,833 founders from 2005-2014, with qualitative case study data from four serial entrepreneurs with a history of addiction. We demonstrate how founders with a history of any addiction are more likely to become serial entrepreneurs, and consequently entrepreneurship addicts, and how the cycle of entrepreneurship addiction plays out for founders with concomitant addictions. We find that some founders trade-up more socially undesirable addictions for the socially acceptable addiction of entrepreneurship, evidencing perhaps a more opaque side of entrepreneurship.

INTRODUCTION

Entrepreneurship addiction is defined as the "need" for some habitual entrepreneurs to compulsively engage with entrepreneurship, and consequence to their compulsive engagement, they become addicted to entrepreneurship (Spivack & Mckelvie, 2018; Spivack, Mckelvie, & Haynie, 2014). Examining the theory of entrepreneurship addiction is important as habitual entrepreneurs make up a large proportion of the entrepreneurs in developed nations (Westhead et al., 2005; Spivack, et al., 2014), and the development of this addiction confers dysfunctional outcomes in one's wider life (Spivack et al., 2014). Namely, habitual entrepreneurs often risk personal relationships in pursuit of entrepreneurship (Schjoedt, 2013; Ufuk & Ozgen, 2001), some report anger with their families who do not understand the realities of entrepreneurship (Logan, 1995), while others report neglect of family, life interests and social networks (Spivack et al.,

2014), some experience illness, insomnia and negative physiological outcomes resulting from their entrepreneurship addiction (Spivack et al., 2014).

While research has provided a strong understanding of the dark side of entrepreneurship addiction (Miller & Le Breton Miller, 2017), the antecedents of developing an entrepreneurship addiction have exceedingly limited empirical evidence. For example, beyond the theoretical conceptualization of entrepreneurship (cf. Spivack & McKelvie, 2018; Spivack, McKelvie & Haynie, 2014) only one study empirically tests entrepreneurship addiction (Spivack & McKelvie, 2021), yet this study does not test for a history of addictions. Thus, we posit there is likely a leading, yet ignored, factor in the development of entrepreneurship addiction: a previous history of addiction. Understanding this potential antecedent is the focus of this paper.

Scholars conclude that an entrepreneurship addiction "involves thought patterns, brain activation and neurological reward systems similar to those characteristic of chemical addictions" (Spivack et al., 2014 p. 653). Given these known similarities, it is surprising that the framework of entrepreneurship addiction has neglected to investigate the antecedent and co-occurrence of entrepreneurship addiction with chemical addictions. Rather, frameworks and theories of entrepreneurship addiction to date have instead focused on "behavioural addictions purposefully" (Spivack et al., 2014). We investigate the potential antecedent entrepreneurship addiction by adopting a mixed-method approach. Specifically, we utilise epidemiological data on 48,833 founders from 2005-2014, triangulating this analysis with multiple case studies of entrepreneurs who have a history of addiction. Ultimately, our research aims to explore if a previous history of chemical addictions predisposes entrepreneurs to an entrepreneurship addiction. Through our case studies, we also aim to develop an understanding of what elements of entrepreneurship might specifically trigger an entrepreneurship addiction for this potentially at-risk population.

Our primary contribution is the inclusion of a broader set of addiction theories beyond behavioural addictions to theoretically conceptualise previous substance addictions as a key antecedent in the development of entrepreneurship addiction, and this is illustrated by epidemiological data of 48,833 entrepreneurs in Denmark. While entrepreneurship literature has speculated about benefits of entrepreneurship addiction like job creation and innovation (Kirchhoff, 1994, Rogers, 2003), it is known that entrepreneurship addiction can have significant consequences for entrepreneurs physical and mental health (Spivack, et al., 2014; Spivack & Mckelvie, 2018). However, the leading antecedents of this addiction remain unknown.

HYPTHESES DEVELOPMENT

Impulsivity, compulsivity and entrepreneurial action

Hundreds of studies have shown negative consequences of impulsivity, yet in the context of entrepreneurship, impulsivity may confer positive implications for entrepreneurial action (Wiklund, et al., 2017). In part, because impulsive people largely charge into uncertain or ambiguous situations (Leland, Arce, Feinstein & Paulus, 2006) due to an inability to delay gratification (Mischel & Metzner, 1962; Mischel, 1961). This ability to proceed despite uncertainty, or even to thrive in uncertainty, certainly confers an advantage for the impulsive entrepreneur. Impulsivity is a particularly prominent trait in people who have addictions. Namely, addiction is conceptualised as a disorder that includes both impulsivity and compulsivity (Koob & Le Moal, 2008). However, as we will cover in a later section, these elements occur at different stages in the three stages of addiction (Kob & Zorrilla, 2010), with impulsivity dominating the first stages, and both impulsivity and compulsivity dominating the later stages (Kobb & Volkow; Kobb & Zorrilla, 2010). This is particularly relevant for entrepreneurship as impulsivity influences entrepreneurial action (Wiklund, Yu, Patzelt, 2018). Uncertainty is an inseparable element of entrepreneurship. Interestingly, in people with pathological gambling, sustained dopamine responses – the feel-good chemical - are elicited from stimuli with maximum uncertainty (Linnet, 2013). This dopamine response in the face of great uncertainty explains the 'feel-good factor' even when experiencing potential or real significant gambling losses. Considering then firstly, the increased entrepreneurial action of impulsive people, secondly, the role of impulsivity of people with addiction, and thirdly, the ability of people with addictions to thrive in extreme uncertainty, we posit higher levels of entrepreneurial action for people with substance addictions.

> H1: People with current or previous substance addictions are more likely to enter into entrepreneurship compared to those with no history of substance addictions

Neuroplasticity

A transition occurs when recreational substance use moves into compulsive substance use, and then chronic substance misuse (Furst, Riba, & Al-Khrasani, 2013). This transition is due to 'neuroplasticity'. Neuroplasticity is the brains' ability to form and reorganise synaptic connections, in response to learning or experience, in this case, the experience of substance misuse. Chronic drug exposure alters the neural networks in the brain (Furst, Riba, & Al-Khrasani, 2013). We posit that firstly, the neuroplasticity which occurs when people move from recreational to compulsive and then chronic misuse of substances may also predispose founders to the same pathway in entrepreneurship due to neuroplasticity. Secondly, we suggest that this process may work into the opposite mechanism too, with founders first becoming addicted to entrepreneurship, and then through neuroplasticity, developing further behavioural or substance addictions. The progressive brain changes which occur as people move to chronic misuse endure long after the individual stops using substances (Washingtion, 2012.). While there are obvious differences in substance addiction and entrepreneurship addic-

tion, we suggest that firstly, considering the role of neuroplasticity this spectrum from recreational engagement to compulsive addiction can also be applied to entrepreneurship addiction. And secondly, we propose that founders who have experienced entrepreneurship addiction may also experience a "craving" once they stop venturing. Namely, we posit there may be a continued "craving" for the thrill and uncertainty that accompanies the different stages of entrepreneurship, even if the founder is no longer in business. Thus, prompting the re-engagement with venturing.

> H2: Entrepreneurs with a history of substance addictions are more likely to (A) start more ventures and (B) become serial entrepreneurs

Performance Consequences

Considering the role of impulsivity and positive reinforcement in the first few stages of addiction, and in entrepreneurship action, we suggest there may be motivational changes for entrepreneurship addicts. Namely, several models of addiction conceptualise the transition from positive reinforcement motivations in the preoccupation stage, to later negative reinforcement in the negative effect/withdrawal stage (Koob & Volkow, 2012; Bevilacqua & Goldman, 2009). We suggest that such a motivational change may be a defining feature of entrepreneurship addiction. Perhaps what was once an impulsive engagement and attraction to entrepreneurship due to anticipation and excitement in launching a new venture, turns into compulsive participation fuelled by negative reinforcement, such as escaping reality, avoiding loss of social networks or avoiding anxiety (Blume, 2001). The shift to compulsivity in the later stages of addiction is also seen in workaholism more broadly, with workaholics "wanting" to work compulsively, without "liking" it (Sussman, 2013; Sussman et al., 2011), creating a significant lifestyle imbalance (Sussman, 2013).

Further, beyond the enhanced entrepreneurial action that addiction may afford entrepreneurs through increased impulsivity, there may be core differences in decision-making capabilities between people with a history of addiction and people without. Research has shown core differences in decision making in people with addictions. Namely, compared to controls, people with substance or gambling addictions have a propensity to make disadvantageous choices during gambling tasks (Mudry, Zohar etc, 70, 72). While entrepreneurial action may be higher for those with addictive tendencies, compulsive engagement fuelled by negative reinforcement, and a potential likelihood of making disadvantageous choices or choices that prioritise immediate rewards, we posit:

> H3: There will be reduced performance for those with substance addictions who become entrepreneurs compared to a control

METHOD

Sample	*Phase one* – quantitative: Epidemiological dataset comprising of (n= 52,318 ventures, 48,833 founders) from 2005 – 2014 *Phase two* - qualitative: Multi-case case study, four serial entrepreneurs with a history of addiction
Phase One: DVs	*Phase One:* Model one: Entrepreneurial entrance, transformed into a binary variable; Model two: Habitual entrepreneurship, transformed into a binary variable to estimate the likelihood that an individual will start more than one venture. Model three: Serial Entrepreneurship, ordinal variable; Model four: New venture team performance, combined income of the founding team.
Phase One: IVs	Substance addictions conditions: We used as addiction resulting in a hospitalisation such as alcohol, opioids, stimulants, tobacco, solvents and psychoactive substance addictions
Phase One: Controls	Corporation, Copenhagen, Turnover, Exports, Expenses, Education, Networth, Venture Length, Firm size
Phase One: Analysis	OLS
Phase Two: Analysis	All interviews were transcribed and processed on Nvivo, with open and axial coding used to form the analysis.

RESULTS

Phase One: Epidemiological Study

Our dependent variable for hypothesis four, New venture team (NVT) performance, is an interval variable, and therefore we employ a standard ordinary least squares (OLS) approach. We test the data for normality using the Shapiro-Wilk test (Greene 2011), for heteroskedasticity with the Breusch-Pagan test (Wooldridge 2004), and multicollinearity by testing variance inflation. The tests show no issues with normality or multicollinearity, however, the Breusch-Pagan test shows that the error term is not constant. To correct for this, we employ the Huber-White estimator (robust standard errors) to correct for the heteroskedasticity issue. Table Two presents the results of our regression models for all hypothesis. Hypothesis one was tested by comparing entrepreneurs to similar non-entrepreneurs 1:1, hence we have twice the number of observations in model one. We separated substance addiction into three categories: alcohol, tobacco and drug addictions. Our analysis shows partial support for model one:

	Model 1	Model 2	Model 3	Model 4
main	becom~t	seria~y	ventu~t	ln_tu~r
drug_alcohol~y	0,128***	0,470**	0,494**	-0,280*
	[]0,026	[]0,215	[]0,220	[]0,146
drug_tobacco~y	0,118	-0,233	-0,212	-0,085
	[]0,134	[]0,175	[]0,163	[]0,344
drug_drugabu~y	-0,038*	-0,007	0,440***	0,017
	[]0,022	[]0,385	[]0,106	[]0,895
age	-0,001	-0,003	-0,005	0,004
	[]0,001	[]0,005	[]0,007	[]0,018
gender	-0,105***	-0,426***	-0,200	-0,490
	[]0,027	[]0,112	[]0,144	[]0,362
children	0,022	0,069	0,081	-0,068
	[]0,014	[]0,045	[]0,059	[]0,162
education	-0,004	0,055*	-0,052	0,228**
	[]0,008	[]0,031	[]0,040	[]0,106
single	0,051*	0,262**	0,265*	-0,068
	[]0,030	[]0,111	[]0,145	[]0,384
team_size	0,259*	0,146	0,367**	0,301**
	[]0,146	[]0,146	[]0,187	[]0,198
ln_exports	0,080	0,001	-0,076	-0,005
	[]0,113	[]0,064	[]0,247	[]0,006
ln_expenses	0,016	0,130	0,010	0,050
	[]0,129	[]0,114	[]0,047	[]0,036
year	Included	Included	Included	Included
industry	Included	Included	Included	Included
Constant	1,556***	4,021***	3,273***	10,956***
	[]0,076	[]0,292	[]0,383	[]0,983
R2	0.130		0.105	0.213
Pseudo LL	-1408.922	-1169.118	-4171.398	-5829.38
No of Obs	104636	52318	52318	52318
chi2		32.10161***		

* p<0.1, ** p<0.05, *** p<0.01

compared to a sample of non-addicted individuals, individuals who are addicted to alcohol are more likely to enter into entrepreneurship. There is no significant difference for tobacco users compared to non-addicted controls. Individuals addicted to drugs are less likely to enter into entrepreneurship compared to the general public.

To test for hypothesis two, we tested a binary outcome to estimate the likelihood that an individual will start more than one venture. We found partial support for this hypothesis, that is, that individuals who had alcohol addictions are more likely to create more than one venture. There was no significant difference for individuals addicted to tobacco and drugs, compared to non-addicted entrepreneurs in general.

To test for hypotheses three, we estimated the number of ventures started by using an ordinal outcome. This analysis was conducted with a linear method, so we can

see the approximated difference in the number of ventures started between different serial entrepreneurs. Namely, we analysed the difference between founders who created two ventures, or any number more than two. We hypothesised that entrepreneurs who are addicted to substances are more likely to start multiple ventures. We found partial support for this. Interestingly, entrepreneurs with alcohol addiction are less likely to repeatedly start more ventures, while there is a non-significant difference for tobacco-dependent individuals. Yet individuals addicted to drugs are more likely to create multiple ventures, compared to non-addict serial entrepreneurs in general.

Finally, to rest for hypothesis four, our dependent variable NVT performance, is an interval variable, and therefore we employ a standard ordinary least squares (OLS) approach. We test the data for normality using the Shapiro-Wilk test (Greene 2011), for heteroskedasticity with the Breusch-Pagan test (Wooldridge 2004), and multicollinearity by testing variance inflation. The tests show no issues with normality or multicollinearity, however, the Breusch-Pagan test show that the error term is not constant. To correct for this, we employ the Huber-White estimator (robust standard errors) to correct for the heteroskedasticity issue. Our hypothesis was partially supported. Interestingly, there was no significant difference in performance between non-addicted controls and drug or tobacco addicted entrepreneurs. However, ventures started by entrepreneurs who are alcohol dependent exhibit lower financial performance compared to other ventures started by non-dependent entrepreneurs.

Phase Two: Qualitative case study

The themes and resulting model which emerged from our data evidenced that there were a common set of experiences across our sample of entrepreneurs with a history of addiction. Two core findings became evident. Firstly, we found significant similarities in the lived experience between other addictions, and entrepreneurship addiction. As we will detail, our data suggest that the mechanism of addiction transfer is fundamental in the development of an entrepreneurship addiction for those with a history of addictions. Interestingly, the lived experience of addiction transfer was shared across all participants, regardless of the type of historical addiction (e.g. substance or behavioural). Secondly, a clear cyclical process emerged from our cases. Namely, it became evident that the obsessive symptoms led addicted entrepreneurs to compulsively engage with entrepreneurship, leading them to neglect themselves and others, which consequently created negative life outcomes, yet despite this, they remained continuously engaged with their venture. We will now discuss these results in detail.

Identifying addiction

Our data suggested a key factor in the lead up to the process of addiction transfer. That factor was heavily identifying as someone of whom addiction is fundamental to their success, e.g. *"You need to have that addictive mindset and addictive*

personality to make it. It is this kind of people and you need to be... you need to have that particular mindset, that particular personality to be able to, to be successful. I think that's a fundamental necessity to be successful" (*participant three*). Our cases strongly emphasised to us that their addictions enhanced their success and performance as an entrepreneur. Interestingly, there was no distinguishing boundary drawn between a substance addiction or an entrepreneurship addiction, the lived experience was expressed the same:

"When it comes to entrepreneurship, I think it is just we are wired differently. I don't know how else to say it. The whole idea of routine and comfort. I don't think... and maybe it is because fundamentally, at the core, we have like a higher... like our survival instincts are bit fu**ing more alive, you know? I think that dopamine hit, you know whatever, is the same. When I smoke a joint, take a glass of whiskey, smoke a cigarette or make a sale. I think it is the same, for sure. It is an addiction."(*participant three*). Because of the strong identifier with being someone who is highly addicted to things, and even that gives a performance benefit, we suggest this neuroplasticity has created the right cognitive conditions to form an additional addiction through addiction transfer.

Addiction Transfer

One case who had a gaming addiction detailed a transfer of his original addiction to his compulsive entrepreneurship:

"And yeah, I kind of woke up at one point where I was like, yeah I am not going to have a life outside of computer games. And so I kind of quit that, just to become a really big workaholic entrepreneur." (participant two).

This case highlighted a fundamental antecedent mechanism in the development of an entrepreneurial addiction. Specifically, by reducing his historical addiction, he explains how he transfers his addiction to entrepreneurship. He detailed this further by saying: *"If I'm doing something like gaming or working [at his start-up, I don't think about anything else, like at all. I still don't see my friends, because I'm just working now, all the time. I just traded gaming with something, you know, more productive by society."* Participant two.

Of importance, in this case, was how he highlighted that although the outcome of his previous addiction (gaming) and his current entrepreneurship addiction are the same – that is he does not see his friends – he thinks society views these addictions differently, he identifies as having 'traded up' on his addiction, from something shameful to something that is at least condoned, if not celebrated.

Obsessed

In our data, we saw numerous examples of being driven by an internal obsession

with aspects of entrepreneurship. Specifically, the first obsession was with a venture or venturing in general; Participant two explained his obsession by saying *"I think, like, the only time I'm not thinking about [the venture] is maybe if I'm watching a movie."* Participant One said *"I am a firm believer in the mindset you have to be obsessed"*, and *"if you wanna be excellent [as a founder], you have to be obsessed."*

The second obsessive behaviour was the compulsion or 'need' to participate in venturing e.g. *"I need to have my own company"* (participant one). The third was the obsessive planning and obsessive anticipation of creating a business e.g. *"I think in my last three years I must have written at least 30 different plans, of like full-blown businesses. It was like a full-blown business developing. I sit down, write them down and then I start to think this is like something I should be doing"* (participant one); or obsessively creating new businesses on a whim e.g. *"I will fu**ing do any business. I almost got into making a mask business a month ago. I put some thought into that. It hit me, everybody is making masks now. But I would very easily [make a new business] if you have a good idea"* (participant three). The final obsession detailed by our cases was an obsession with the risk involved in a new venture e.g. *"[My start-up] you know it's kind of, well my entire life that depends on it, so you know. I really like the risk, it's a lot of fun."* Participant Two.

Neglects All Else

second theme we established in our cases was that of *'neglecting all else'* in pursuit of entrepreneurial success. This was particularly prominent across all cases, as cases shared examples of the many times they simply neglected any other responsibility in their life for the thrill of being involved in their start-up. The first element identified in this theme was feeling an intense thrill of partaking in the business. For example, participant three said *"Last week [because of my start-up] I felt like I was fu**ing high and I was completely sober. On Friday I made two sales, very, very expensive sales. That is a fu**ing rush."*

For these entrepreneurs to experience the thrill and the high of chasing success, making sales, starting a new product or getting funding, they often neglected other important aspects of their life. For example, participant two said, *"Like I know I'm not going to be the best friend to my friends, but I think I just value work more than that."* This neglect of friends and relationships was mirrored in other cases. *"We would go out for dinner, a group of friends or whatever, and I had to step out for fifteen minutes or leave earlier shortly. So I wasn't really there, you know? Like my mind was always somewhere else thinking about work."* Participant Three. Participant One commented about how others in his life perceive he neglects them for his start-up *"So, the girl I am kind of dating now, she's just been like "you don't have time for me"*, but he does not mind as he *"doesn't believe in work-life balance, fundamentally I just think it is bulls**t"*. This lack of work-life balance, which led to a neglect of other parts of life was shared by participant three: *"It just follows you, like you can´t check out or it is very hard to. Like there is no day-off, there is no day-off!"*

Negative Outcomes From an early obsession with their business to a thrill that led to the neglect of other aspects of life, came negative life outcomes as consequence. We found two main negative outcomes. The first being negative consequences in relationships with friends and family. For example, *"I have several friends who are like, 'hey, we haven't seen you in like five months'. I'm like, 'hmmm yeah okay'… 'Do you have time or?' I don't feel like I have the time. I'd rather be working I guess. I have a lot of friends who want to see me, and tell me work I work too much and I look like trash all the time. I look tired and hammered"*, Participant Two.

Other cases explained how they saw less of their parents and family, less of their friends, and struggled to maintain a significant relationship due to how much they worked on their venture. This neglect of relationships led to isolation. Participant Three detailed this isolation: *"So yeah, I think "[my] personal relationships have deteriorated. There was a period where I had a really, really big work accomplishment or goal that I set out for myself and then I came home and I called my friends and they were out together, nobody answered. They didn't invite me. My parents didn't really care, they didn't really know, because they didn't really know it was a thing. And the people that I called were not available and I wasn't in a committed relationship of any kind. So I was like "Holy f***! Let's get out in a bar and celebrate by myself." You know?. That was a bit of a reality check."*

The second negative outcome was the personal wellbeing and health of the addicted entrepreneur. Among the cases, entrepreneurs detailed that without their business or without being able to work, they would experience withdrawal. *"I would be miserable"* (participant two); *"Oh no, I'd be fu**ed [if I couldn't work]. I'd have anxiety, serious anxiety. I don't think I'd be able to function."* (participant one).

DISCUSSION AND IMPLICATIONS

Nascent entrepreneurship literature has posited how entrepreneurship addiction is a fundamental component of the 'dark-side to entrepreneurship' (Spivack, et al., 2014), and that understanding the antecedents for this deleterious addiction is essential (Spivack & McKelvie, 2014) Yet, by neglecting to utilise theories of substance addictions from mainstream addiction literature, entrepreneurship literature to date has neglected to study a potentially leading antecedent: a history of previous addictions. This present study integrated mainstream theories from the field of addiction studies and expands beyond behavioural addiction theories to analyse the effect of all forms of previous addictions on becoming a habitual entrepreneur. We teamed this epidemiological study with qualitative multi-case studies to understand the lived experience and mechanisms of developing an entrepreneurship addiction. This study is a first step in viewing substance addictions as an integral antecedent to entrepreneurship addiction. Our epidemiological study suggests that having an alcohol addiction makes people more likely to both become an entrepreneur and to start multiple ventures. Whereas, having a drug addiction initially decreases entrepreneurial entrance, yet entrepreneurs

with drug addiction are more likely to become serial entrepreneurs. Our case studies show the cycle of entrepreneurship addiction (obsession, neglect of other responsibilities, negative life outcomes), and enable us to identify addiction transfer as a key mechanism in the development of entrepreneurship addiction for entrepreneurs with concomitant addictions.

These findings are important for two reasons. Firstly, we respond to calls for further investigation of the dark side of entrepreneurship (Miller, 2015). Entrepreneurship addiction has been labelled as a deleterious outcome for entrepreneurs (Spivack et al., 2014), negatively impacting the quality of life outside of work (Shepherd & Haynie, 2009). Through identifying the mechanism of addiction transfer, we speculate that for some entrepreneurs with a concomitant addiction, may practice a 'trading up' of addictions, from an addiction which was a source of shame (gaming, substance dependency, sex addiction), to an entrepreneurship addiction which may be socially condoned, and lead to financial reward. We see a more nuanced representation of entrepreneurship addiction, where, in some instances, more destructive addictions were transferred to entrepreneurship. And while the consequences of entrepreneurship addiction were still present, they were not as damaging for personal wellbeing as the original addiction. Because of this, we speculate that for this specific group of entrepreneurs, having an entrepreneurship addiction may be more of an 'opaque side' than a 'dark side'. For example, if an entrepreneur reduces their substance to be an entrepreneur, even accounting for the physiological stress of running a business, they may experience less net negative physiological consequences from their addiction overall.

Secondly, a consequence of developing an entrepreneurship addiction, many entrepreneurs will face negative life outcomes, including loss of relationships and negative physical and emotional well-being. As such, identifying which entrepreneurs are most at risk for this addiction is imperative. In line with evidence which establishes a pattern of co-occurrence between substance and behavioural addictions (Sussman et al., 2011), we suggest that having a history of previous addiction puts entrepreneurs in an at-risk category for developing an entrepreneurial addiction.

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