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Early-stage business model experimentation and pivoting

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ABSTRACT

Recent literature suggests entrepreneurs struggle to pivot—or fundamentally change aspects of their venture—due to identity-based resistance to change. Yet, when entrepreneurs receive negative feedback, overcoming this resistance may be important to pivoting their business model. We adopt a convergent, mixed methods research design to explore when and why some entrepreneurs overcome resistance to change in response to negative feedback during early-stage business model experimentation. Building upon qualitative data that we gathered and analyzed, we theorize entrepreneurs may resist pivoting their value proposition relative to other business model components despite receiving negative feedback on this aspect of their business model. However, we find three factors – entrepreneurial experience, startup mentoring, and team size – may enable entrepreneurs to pivot in response to negative feedback. We theorize that these factors broaden a startup team's perspective, enabling value proposition pivoting during early-stage business model experimentation. We test these relationships with quantitative data from 80 startups engaged in business model experimentation and find support across hypotheses. We contribute to understanding when and why entrepreneurs pivot aspects of their business models in response to negative feedback during early-stage business model experimentation.

Executive summary: The entrepreneurship literature suggests startups may benefit from experimentation and pivoting different parts of their business model in response to negative feedback from stakeholders (Andries et al., 2021; Camuffo et al., 2020; Shepherd and Gruber, 2021). In early stages of starting a new venture, a business model refers to a cognitive schema or belief about an activity system that could potentially create and capture value (Massa et al., 2017; Shepherd and Gruber, 2021). Business model experimentation is the process of testing assumptions underlying this potential business model and pivoting business model assumptions in response to negative feedback (Andries et al., 2013; McDonald and Eisenhardt, 2020; Leatherbee and Katila, 2020). Building upon prior literature, we define *business model pivoting* as a fundamental change to parts of the business model (Berends et al., 2021; Snihur and Clarysse, 2022; Shepherd and Gruber, 2021). Yet, literature also suggests founders often struggle to pivot assumptions despite negative feedback. Motives to preserve and protect certain assumptions relevant to founders' identities can interfere with pivoting (Grimes, 2018; Kirtley and O'Mahony, 2023; Zuzul and Tripsas, 2020). Despite the general understanding that founders struggle to change their ideas, however, the entrepreneurship literature currently lacks precise insight into when and why founders can overcome resistance to pivoting.

In this research, we explore when and why startups pivot different parts of their business model. We do so within the context of early-stage business model experimentation, where founders explicitly state assumptions about different parts of their potential business model, test those

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assumptions against stakeholder feedback, and are encouraged to pivot business model components in response to negative feedback. Through a mixed methods research design, we find (1) founders tend to resist pivoting their value propositions relative to other parts of a business model in response to negative feedback; and (2) entrepreneurial experience, startup mentoring, and team size enables startups to overcome this resistance to pivoting in response to negative feedback. We theorize these factors broaden founders' perspectives (Warshay, 1962), contributing to a greater willingness to pivot during experimentation.

We contribute to the literature on entrepreneurial pivoting by explaining nuanced variation in pivoting distinct business model components during experimentation. This contribution is important because it reveals that resistance to pivoting the business model may be more complex than previously thought. We also contribute to the literature at the nexus of business model experimentation and entrepreneurial cognition by finding that entrepreneurial experience, startup mentoring, and team size enable startups to pivot despite psychological resistance to pivoting in response to negative feedback because it broadens founders' perspectives. This insight is important theoretically because it advances what we know about enabling experimenting with business models under conditions of uncertainty. The research presented here has clear and important implications for practice. This research suggests founders often resist changing the value proposition versus other components of their business models in early stages of venture development. This resistance can impede experimentation and pivoting in response to negative feedback. To the extent founders want to broaden their perspective to enable pivoting their value propositions in response to negative feedback during early stages of venture development, our data suggest they may be able to do so by recruiting members with entrepreneurial experience on their team (or gain entrepreneurial experience themselves), engage frequently with startup mentors, and increase the size of their team. Overall, we view the breath of perspective that comes from experience and interactions with others as an advantage for entrepreneurs when experimenting with their business models during early stages of venture development.

1. Introduction

The entrepreneurship literature suggests startups may benefit from experimentation and pivoting business model components in response to negative feedback from stakeholders (Andries et al., 2021; Blank and Eckhardt, 2023; Camuffo et al., 2020; Ries, 2011). In early stages of a new venture, a business model refers to a cognitive schema of a potential activity system designed to create and capture value (Massa et al., 2017; Shepherd and Gruber, 2021; Snihur & Eisenhardt, 2022). Business model experimentation is the process of testing assumptions underlying a potential business model schema and pivoting aspects of the business model in response to negative feedback (Andries et al., 2013; McDonald and Eisenhardt, 2020; Leatherbee and Katila, 2020). Building upon prior literature, we define *business model pivoting* as a fundamental change to a business model component (Berends et al., 2021; Shepherd et al., 2023; Shepherd et al., 2023). Yet, startup founders often struggle to change business model assumptions in response to negative feedback. Identity-based motives to preserve beliefs and assumptions related to founders' self-concept may conflict with the capacity to change aspects of an emerging business model in response to negative feedback (Grimes, 2018; Kirtley and O'Mahony, 2023; Zuzul and Tripsas, 2020). Despite the general understanding that founders struggle to change their ideas, however, the entrepreneurship literature currently lacks precise insight into when and why some founders can overcome resistance to pivoting distinct business model components during early-stage business model experimentation.

In this research, we use a convergent, mixed-methods research design to explore when and why startups pivot different aspects of their business model. We do so within the context of early-stage business model experimentation, wherein startup founders explicitly state business model assumptions, test those assumptions against stakeholder feedback, and are encouraged to pivot business model components in response to negative feedback. Through an exploratory qualitative analysis in Study One, we observe that founders are more willing to pivot when negative feedback relates to peripheral aspects of their business model—the activity system designed to deliver value. By contrast, founders resist pivoting the value proposition of their business model despite receiving negative feedback from stakeholders. This finding is important because the value proposition may be critical to pivot in response to negative feedback during early-stage business model experimentation to realize value creation (Camuffo et al., 2020; Danneels, 2007; Marvel et al., 2020; Zellweger and Zenger, 2021; Zott and Amit, 2007, 2008).

In further exploring the qualitative data, we also found three factors may facilitate pivoting in response to negative feedback: entrepreneurial experience, startup mentoring, and team size. We theorize these three factors reflect the startup team's "breadth of perspective" (Warshay, 1962, p. 149), or "the range of alternative solutions that one is able to bring to mind when presented with a problem." We theorize breadth of perspective enables startup teams to become more receptive to pivoting their value proposition in response to negative feedback. Following the findings of Study One, we then develop and test a set of hypotheses in Study Two using quantitative data of 80 startups participating in a five-week program designed to experiment with business model assumptions. In this setting, we directly measure negative feedback from stakeholders that each startup received, and founders' responses to this feedback, across different business model components. Collectively, our findings suggest that (1) when startups receive negative feedback during experimentation, they tend to resist pivoting their value propositions relative to other business model components; and (2) breadth of perspective proxied through three factors (entrepreneurial experience, startup mentoring, team size) enables startups to overcome

resistance to pivoting the value proposition (relative to other components) in response to negative feedback.

We contribute to the literature on entrepreneurial pivoting by explaining nuanced variation in pivoting distinct business model components during experimentation. While prior research accounts for founders' consideration of alternative opportunity sets (Gruber et al., 2008, 2012, 2013), testing multiple business model designs simultaneously (Andries et al., 2013), and why founders may or may not change actions in response to feedback (Anseel et al., 2015; Kluger and DeNisi, 1996; Haynie et al., 2012; Furr et al., 2012), we know little about how founders respond to negative feedback during experimentation at the business model component level (cf. Osterwalder et al., 2005). We find entrepreneurs resist pivoting the value proposition versus other aspects of a business model despite receiving negative feedback about this component. This contribution is important because it reveals that resistance to pivoting the business model may be more complex than previously thought. We also contribute to the literature at the nexus of business model experimentation and entrepreneurial cognition (Gruber et al., 2008, 2012, 2013; Snihur and Clarysse, 2022) by finding that entrepreneurial experience, startup mentoring, and team size enable startups to pivot despite psychological resistance to change during early-stage experimentation. This insight is critical theoretically because it advances what we know about enabling experimenting with business models under conditions of uncertainty (Andries and Debackere, 2007; Andries et al., 2013). We propose a key mechanism that ties these enablers together is the notion of a *breadth of perspective* (Warshay, 1962). A breadth of perspective opens founders to change when confronting negative feedback during early-stage business model experiments. We now briefly review the literature on business model experimentation and pivoting in response to negative feedback.

2. Theoretical background

The literature suggests that nascent founders forming new ventures benefit from experimentation because it helps them manage uncertainty (Andries and Debackere, 2007; Camuffo et al., 2020; McDonald and Eisenhardt, 2020). To manage uncertainty, founders can test out new business model configurations based on information elicited from potential stakeholders (Blank and Eckhardt, 2023; Gruber et al., 2013). One means by which founders can clarify and reflect their assumptions prior to developing a tangible business is via a business model (Amit and Zott, 2001). A *business model* refers to the system of activities performed within an organization and between the organization and other market actors to create and deliver value (Zott and Amit, 2010; Zott et al., 2011). In early stages, a business model refers to a shared cognitive schema of the founding team that can be symbolized through graphical depiction (Massa et al., 2017; Shepherd and Gruber, 2021). One way to depict a startup team's business model schema is using the *Business Model Canvas*[1] ("BMC"; Osterwalder and Pigneur, 2010)—a framework consisting of nine components capturing an organization's infrastructure. According to Osterwalder et al. (2005), these nine components include (1) customer segments, (2) value proposition, (3) customer channels, (4) customer relationships, (5) revenue streams, (6) key resources, (7) key activities, (8) key partners, and (9) cost structure.

The BMC has become a popular tool to specify the assumptions and beliefs underlying a new startup's business model and then test these assumptions through experimentation (Bocken and Snihur, 2020; Bojovic et al., 2018). When experimenting with a new business model, founders first make business model assumptions explicit using the BMC. These initial assumptions act like scientific hypotheses subject to falsification (Blank and Eckhardt, 2023; Camuffo et al., 2020; Zellweger and Zenger, 2021). Founders then test assumptions by interviewing potential stakeholders and interpreting information from these interviews as validating or invalidating these assumptions (Leatherbee and Katila, 2020). When founders receive information generated from these interviews as evidence that indicates a business model assumption may be false or invalidated, i.e., *negative feedback* (Kluger and DeNisi, 1996), founders are often encouraged to respond with a *business model pivot*, or a fundamental change to a business model component (Shepherd et al., 2023; Shepherd and Gruber, 2021). Founders do so by replacing unsupported assumptions with new assumptions, thus revising their initial business model schema. Founders then cycle through this process until they believe they have sufficient evidence for a coherent and viable business model that creates value (Zellweger and Zenger, 2021). Research suggests business model experimentation, and especially pivoting in response to negative feedback from stakeholders, facilitates long-term survival prospects for new ventures (Andries and Debackere, 2007; Camuffo et al., 2020; McDonald and Eisenhardt, 2020; Pillai et al., 2020).

However, the literature also suggests negative feedback can conflict with founders' self-related motives to preserve what they believe is core to their emerging business model schema. Within the entrepreneurship literature, Grimes (2018, p. 1698) observed that "founders indicated they viewed their proposed solutions—and, by extension, the specific problems they had identified—as core to their ideas, and thus personally meaningful." In turn, founders resisted changes to their ideas. According to Grimes (2018, p. 1694), psychological ownership (Pierce et al., 2001) explained why founders were reluctant to change: "…in developing such ownership, ideas can become viewed by creative workers as extensions of the self, contributing to their identities and self-efficacy." Founders identified with their ideas because these ideas represented extensions of founders' identities (Abelson, 1986; Baer and Brown, 2012; Belk, 1988). Research also suggests identity-based processes such as roles adopted by founders as "revolutionaries" versus "discoverers" (Zuzul and Tripsas, 2020), or "visionaries" versus "scientists" (Grimes, 2018), or identification with an emerging organizational identity (Snihur and Clarysse, 2022) can all contribute to resistance to change.

Despite the general understanding that startups resist change, the literature overlooks two issues. First, research on business model experimentation has neglected to account for how founders process and respond to negative feedback across the multiple components of a business. Extant theory suggests entrepreneurs resist change in general (e.g., Grimes, 2018; Zuzul and Tripsas, 2020), but whether

[1] See https://www.strategyzer.com/canvas/business-model-canvas for the BMC tool.

specific aspects of a business model are more resistant to change remains an open question. In this research, we offer a more nuanced perspective of when founders resist pivoting in response to negative feedback on distinct aspects of their business models during experimentation. We do not seek to refute current perspectives on pivoting, but to build upon them and enrich them with a more nuanced perspective. We take seriously the emerging perspective that suggests the business model is critical to explaining entrepreneurship phenomena (McDonald and Eisenhardt, 2020; Shepherd and Gruber, 2021; Shepherd and Gruber, 2021; Snihur and Clarysse, 2022).

A second concern is that, despite the broad understanding that entrepreneurs resist change, we know startups in practice do pivot. Hence, explaining what factors enable entrepreneurs to overcome resistance to change represents an important advancement for the entrepreneurship literature. Understanding what factors enable entrepreneurs to overcome resistance to pivoting in response to negative feedback is an important area of inquiry because it can advance knowledge of the social psychological mechanisms that facilitates early-stage business model experimentation (Shepherd and Gruber, 2021; Zellweger and Zenger, 2021). These insights can in turn provide important practical guidance to entrepreneurs engaged in early-stage experimentation.

3. Mixed methods overview

To better understand the dynamics of business model experimentation and pivoting, we used a convergent, mixed-methods research design (Creswell and Clark, 2018). This approach allows us to generate and test accurate and generalizable theory by triangulating evidence across qualitative and quantitative data (Edmondson and McManus, 2007; Jick, 1979). In Study One, we use qualitative data to explore when and why founders pivot aspects of their business model. We adopt a methodological bricolage approach to qualitative research (Pratt et al., 2022), which involves "the combining of analytical moves for the purpose of solving a problem or problems tailored to one's own research project" (p. 219), by borrowing and combining qualitative analytical moves from the extended case study method[2] (Burawoy, 1998; Danneels, 2007) and grounded theory (Corbin and Strauss, 2015; Gioia et al., 2013). We generate hypotheses from these qualitative findings and test these hypotheses with quantitative data in Study Two with 80 startups. Fig. 1 shows an overview of our methodological approach.

4. Study one: exploratory qualitative study

4.1. Qualitative data collection and analysis

At the beginning of our research, we set out to better understand how founders think about their business models during experimentation, how the different components of the business model are viewed by founders as they experiment, and what factors helped founders overcome resistance to change. To these ends, we purposefully sampled entrepreneurs experimenting with their early-stage business models (see online Appendix A). Our qualitative analysis unfolded in two phases. In Phase I, we first conducted pilot interviews with 15 entrepreneurs to surface initial concepts, develop our interview protocol, and guide theoretical sampling (Corbin and Strauss, 2015). Then in Phase II, we used our revised protocol (see Appendix B) to conduct and analyze 42 interviews with 32 nascent entrepreneurs engaged in business model experimentation and 3 startup mentors (some informants were interviewed multiple times). In Phase II, we also asked some entrepreneurs to engage in an exploratory circle task that further support our qualitative findings. Specifically, we asked entrepreneurs to think aloud as they positioned different components of their business models in relation to a center circle that said "YOU" and then measured the distance between the center circle and each business model component following prior literature (Carter and Gilovich, 2012). We took the proximity of each business model component relative to the center circle as reflecting varying degrees of founder identification with each business model component (Bergami and Bagozzi, 2000; Carter and Gilovich, 2012; Kreiner and Ashforth, 2004). We describe the qualitative analysis in more detail in Appendix C and detail the exploratory circle task in Appendix D.

4.2. Qualitative findings

Findings below are based on the holistic analysis of the interviews and circle task combined. Two critical findings emerged from this holistic qualitative analysis.

4.2.1. Finding #1: value proposition attachment and resistance to pivoting

The first salient finding that emerged was that founders seemed to feel a strong attachment toward their value proposition. For example, a founder told us that pivoting the value proposition was an emotional decision for them and that they would resist proposed changes:

> For me personally, there's like **an emotional attachment** to this idea that like I have found a solution that nobody has worked on before to solve problem for somebody in a novel way, and **I think that's what your value proposition is** like I think that I

[2] In the extended case study approach, researchers cycle multiple times between data collection, data analysis, and existing theory to develop an elaborated theoretical model (Danneels, 2007). As Danneels (2007: 514) describes, "the researcher examines the literature relevant to his/her problem area and employs the empirical data to fill in its gaps, reveal its flaws, and elaborate its meaning, and extend its coverage."

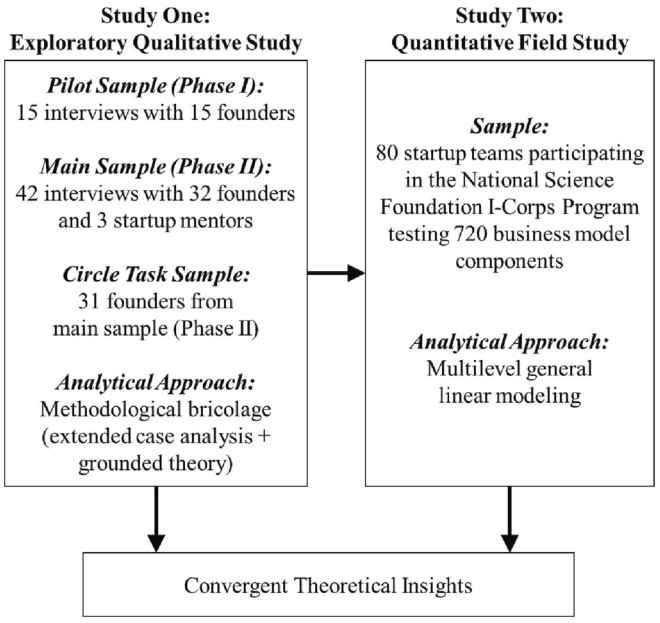

Fig. 1. Overview of mixed methods approach
Note: This diagram illustrates how we used both qualitative and quantitative data across two studies to generate convergent theoretical insights.

> have a novel solution here for mental healthcare, and so if I'm getting feedback that my value proposition is not as valuable as I thought, **there's probably going to be some resistance to that** because it feels almost like it's invalidating your entire startup concept.
>
> (Matt)

This resistance to change corresponded with the importance that founders placed on the *value proposition* component of their business model (one of the nine distinct components of the BMC). Most founders referred to this component as the "essence," the "core," or the "most important." The following two founders captured what the value proposition meant to them:

> what I think, is the essence of the business … I mean, without that, the business doesn't have any meaning … Let's say it is a root. Without a root, there is no tree…
>
> (Felix)

> … [the value proposition] represents a turning point for the whole planet in my mind…**So the whole value** of the lightweight - all of the components that go into my innovation **can't change much**…
>
> (Lenny)

In contrast, the thought of changing other business model components in response to negative feedback appeared less concerning to founders. For example, another founder described other business model components as "the details" during the circle task:

> I'm actually going to put key activities last and key resources next. I mean **…to me more of the details** …these [other components] are **more the details** about how we ultimately pull this off.
>
> (Jack)

Overall, founders arranged business model components by importance during the circle task, with the value proposition most often deemed most important relative to other business model components. In turn, founders reported stronger attachment with the value proposition because it represented the most important aspect of their business models. As one founder described:

> …The **value proposition is just so important**…I think it just kind of takes over everything else … I think that's **the most important**. Because we're trying to make something that is truly unique, and so I guess it's hard to not sort of get **a sense of attachment to the value proposition**…
>
> (Morris)

We offer additional evidence of Finding #1 using a novel circle task in Appendix D indicating founders more strongly identified with the value proposition relative to other business model components. We also offer additional qualitative illustrations in Table E.1 in Appendix E.

That founders feel attached to their ideas is not new (e.g., psychological ownership and/or identification with ideas; Grimes, 2018),

but the notion that founders vary in their attachment toward and willingness to pivot the value proposition *in comparison to other aspects of their business model* (i.e., the other eight components) is novel and important. This variation has implications for startups attempting to engage in experimentation with their emerging business model schemas. Pivoting the value proposition in response to negative feedback may be critical to successful business model experimentation in early stages of venture development (Camuffo et al., 2020; Marvel et al., 2020; Shepherd and Gruber, 2021; Zellweger and Zenger, 2021; Zott and Amit, 2008) but founders may resist pivoting this specific component of their business model. After discovering founders are more likely to pivot peripheral aspects of their business model and resist pivoting their value proposition despite negative feedback, we explored the set of factors that might facilitate a willingness to pivot the value proposition in response to negative feedback.

4.2.2. Finding #2: Enablers of pivoting

Three factors emerged from our investigation into what could enable pivoting in response to negative feedback. First, we found that ***entrepreneurial experience***, or specific human capital within the entrepreneurial domain (Ucbasaran et al., 2010) may enable pivoting. Experience enabled founders to engage with negative feedback more objectively relative to startups with less experience. For example, one founder observed experienced entrepreneurs "think in different ways," recognizing his initial ideas will likely need to change when negative customer feedback is received:

> So, **from my personal experience**, prior to this I-Corps…associated with two different products…you always want something which would help people, which would actually go out there and change something. **A lot of time that doesn't happen**… You would hardly find a few who actually **have had experience with prior startups, and they think in a very completely different way**… If the customer doesn't want anything, try not to force them. That's what I know from **my previous experience**.
>
> (Victor)

Another founder explained how his prior entrepreneurial experiences helped him remain open minded when receiving negative feedback from customers:

> "I think that you have to really understand what the value is that you're offering to the consumer, and it's usually not, **at least in my experience, it's usually not what you think it is**…"
>
> (Morris)

We interpreted this as initial evidence that founders with greater entrepreneurial experience are more likely to be able to overcome resistance to pivoting when they receive negative feedback.

The second factor that helped entrepreneurs overcome resistance to pivoting in the face of negative feedback was ***startup mentoring***, or the frequency with which founders engage with mentors. As organizational outsiders, startup mentors provided an unbiased perspective and straightforward advice. For example, one startup mentor reported the following when asked about their experience collaborating with founders during the program:

> [We] try to put the question in terms of, "is there really a need out there for this?" **The mentor is more an unbiased person coming in and just providing more like a consultant to the team.**
>
> (Steven –Startup Mentor)

Startup mentors would challenge founders' pre-conceived beliefs and redirect attention toward alternative possibilities. In turn, founders were receptive to mentors; mentors served a sense-giving role that enabled consideration of alternative paths when facing negative feedback. For example, founders seemed open to pivoting after listening to startup mentors, as one founder told us:

> I'm very open to changing… it goes back to being in the course and pivoting. I'm not so arrogant that if I have mentors and influential people, they tell me, "No, this does not make sense, look at it this way," or **my mentor is constantly challenging me, "Oh, you always think about Nigeria, but maybe you could also make revenue here in America. Maybe you could have tours here. We know your heart is in Nigeria, but don't close out opportunities here."** So, I'm not ignorant to that and I'm open to that. So definitely I'm up for change and I'm up for pivoting, but it has to make sense.
>
> (Andrew)

The third factor that enabled founders to overcome resistance to pivoting in response to negative feedback was ***team size***, or the number of founders on a startup team. Members of larger founding teams viewed the success of the new organization as superseding individual priorities. For example, when asking one founder how he reconciled his connection to the value proposition with potential changes suggested by his team, he responded:

> Because I'm no one…If I made that company, that company is important. I'm just a part of it. So, the whole team has to work… **Because my success is the company's success**, and I have to be a part of the company. If I founded, now I'm a part of something big. **I have to work with people**…I have to work for the success of the company. I'm not alone.
>
> (Alex)

A greater team size provoked discussion and debate among the team, which in turn forced co-founders to explain why implementing specific changes would achieve organizational viability. For example, one founder described how discussions unfolded during team meetings:

> It's difficult to find a founding team… **It took a while for us to actually speak the same language** because of just our different industries and different experience previously… We actually have different skillsets…and **the whole team verbalizes and explains to each other why** this feature would help [the customer], why this channel would be the best one to reach [the customer], why these partners would be the best for us to deliver the tech specification that we need…
>
> (Jennifer)

In sum, we observed that entrepreneurial experience, startup mentoring, and team size all seemed to enable founders to overcome psychological resistance to pivoting in response to negative feedback. *Entrepreneurial experience* seemed conducive to the ability to think in alternative ways than inexperienced entrepreneurs during experimentation; *startup mentors* prompted founders to challenge their assumptions and consider new possibilities; and *team size* provoked discussion and debate among co-founders, prompting multiple solutions to the problem of responding to negative feedback (see Table E.2 in Appendix E for additional illustrations). With these factors in mind, we turned to developing conceptual links to further understand and theorize the broader mechanism that might tie these enablers together.

4.3. Theory elaboration: breadth of perspective as an attachment reduction mechanism

With initial insight into factors that might allow entrepreneurs to overcome resistance to pivoting in response to negative feedback, we turned to the literature to search for a mechanism that could tie these enablers together, consistent with analytical moves from the extended case study design (Danneels, 2007). Iterating between the qualitative findings and literature, we discovered a book chapter by Warshay (1962) on the concept of *breadth of perspective*. Warshay defines breadth of perspective as follows:

> The concept refers to the *range* of alternative solutions that one is able to bring to mind when presented with a problem. It thus focuses attention *not* upon the nature of the response *actually made*, but rather on the breadth of responses that one can call to mind before overtly responding. And it asks further: what accounts for the fact that, when presented with a problem, some people can 'think of' more different *kinds* of alternative solutions—regardless of the one they may actually use, or the one that may succeed—than others? (p. 149).

We found this concept could be useful for tying the enablers together. According to Warshay (1962), perspective refers to the capacity of an actor to ascribe symbolic meaning to a situation at hand to determine how to act in such a situation. A perspective can be thought of as a frame of reference or window through which actors perceive and interpret the world and social situations around them. A breadth of perspective is thus the scope or range of possible frames, ideas, or alternative perspectives one can bring to mind. If a perspective is a window to the world, a person with a broad perspective can see through more windows. People and groups with a broader perspective can "see" more alternative solutions or frames of reference than those with a "narrower" perspective. Importantly, the concept does not refer to the actual, overt response made, but rather "the number of different *kinds* of possible alternative solutions that an actor is able to think of, when stimulated, regardless of what may follow overtly" (Warshay, 1962: 151).

We found initial evidence for this mechanism. For example, one founder told us:

> "The interesting thing was when I start talking to people, I start learning about their needs and **especially their perspective**"
>
> (Yogi)

And when responding to a question about why entrepreneurs pivot, a mentor described it this way:

> In the beginning, what is most important is trying **to understand what are the pain points from the customer side?** What exactly are the needs out there? Independent of the know-how the team has. And I think that is a transformational experience for many …I think it's an eye-opening experience…they can then bring this back and **put things into perspective**… (Stephan – Entrepreneur and Startup Mentor)

Breadth of perspective seemed to be a key mechanism that expanded founders' beliefs about what value they could provide. This breadth of perspective enabled entrepreneurs to consider a greater number of solutions to their problem of creating value in response to negative feedback. For example, one founder told us the following about how he responded to negative feedback:

> I mean honestly there's been some frustration there that we've had, but we have responded by … **We've been thinking about what are other ways that we can go about this**. For example, we went from the beginning going to sell our device to doctors … to now thinking about maybe this is an off the shelf device that gets sold at a Walgreens or a CVS or a pharmacy or maybe even a part of those blood pressure devices…That seems to be striking a chord with some of the people we're talking with now. That's how we've used those answers and **that negative feedback to pivot our idea quite a bit**.
>
> (Jack)

In thinking about "what other ways to go about this," this founder was seeking more solutions to address negative feedback. In finding these solutions and expanding his belief about his idea, this founder appeared more receptive to pivoting. Hence, we propose that breadth of perspective explains why some founders but not others are more receptive to pivoting in response to negative feedback. We assert *entrepreneurial experience*, *startup mentoring*, and *team size* all broaden a team's perspective, enabling them to pivot the value proposition of their business models in response to negative feedback during early-stage business model experimentation.

A breadth of perspective could serve as a plausible mechanism to reduce value proposition attachment for two reasons. First, people with a broader perspective can appreciate alternative points of view, thus opening one up to valuable ideas that might go against the

initial dominant perspective of the group. A broader perspective hence creates an openness and receptivity to new ways of proposing value grounded in the customer's frame of mind rather than a singular focus on aspects of the venture tied to one's own perspective and identity. Second, a broader perspective may facilitate the psychological ownership reappraisal process theorized by Grimes (2018) by clarifying role expectations as "scientist" founders experimenting with their business model concepts against stakeholder feedback. A broadened perspective encourages objectivity when evaluating evidence, prompting entrepreneurs to test assumptions like a scientist objectively evaluating a theory. In turn, adopting this scientific founder role may encourage startup teams to respond to feedback that challenges their original value proposition assumptions.

Overall, the exploratory analysis in Study One suggested that startup founders are less willing to pivot the *value proposition* of their business models. However, startup founders may be more willing to pivot this aspect of their business model in response to negative feedback when startups (a) have *entrepreneurial experience* on the team, (b) engage more frequently with *startup mentors*, and (c) have a larger *team size* because these factors contribute to a greater "breadth of perspective" (Warshay, 1962). Consistent with the extended case study method to cycle back to the literature (Danneels, 2007), we now elaborate these insights from Study One by theorizing and testing relationships that explain when and why startups pivot in response to negative feedback.

5. Study two: quantitative field study

The findings from Study One suggest founders feel attached to the value proposition of their business models. Turning back to the literature, we theorize attachment toward the value proposition exists in the form of collective identification with and collective psychological ownership over the value proposition (Gray et al., 2020; Grimes, 2018). Insights from the feedback literature suggests feedback can be influenced by self-related motives to protect, preserve, and enhance extensions of one's identity (Anseel et al., 2015; Kluger and DeNisi, 1996). Founders hence resist changing the value proposition because collective identification and psychological ownership limits founders' receptiveness to negative feedback, contributing to a collective resistance to changing the value proposition in response to negative feedback.

Value proposition attachment may therefore come with a cost during business model experimentation. Value proposition attachment may direct attention away from important information from the external environment. As Schilke (2018: 17) suggests, "strongly identifying individuals tend to reject information that threatens the local reality of the in-group, especially when that information originates from external sources." Pivoting in response to negative feedback may also contribute to a sense of personal loss (Baer and Brown, 2012; Belk, 1988; Grimes, 2018). This motive to maintain business model components that founders identify with will be especially potent within our research context. We theorize that under conditions of uncertainty, value proposition attachment may help founders feel anchored to a sense of stability and control (Hogg, 2000, 2021). Yet, founders' connection with the value proposition (see findings from Study One) may cause them to ignore negative feedback toward this aspect relative to feedback about other components of the business model (Grimes, 2018; Schilke, 2018). In turn, founders resist changing this aspect in response to negative feedback to preserve business model components linked to their collective self-concept (Anseel et al., 2015; Kluger and DeNisi, 1996). Formally, we hypothesize:

Hypothesis 1. (H1). The likelihood of pivoting in response to negative feedback will be lower when the feedback relates to the value proposition relative to other business model components.

5.1. Enablers of pivoting

Given the importance of entrepreneurial experimentation for new startups, pivoting the value proposition in response to negative feedback can be critical to value creation and survival (Camuffo et al., 2020; Zellweger and Zenger, 2021; Zott and Amit, 2008). In the formation of a new business model, founders must therefore strive to pay more attention to data and evidence that conflicts with their initial beliefs and ideas during experimentation. As Study One suggested, founders reported more willingness to engage in experimentation when they had greater entrepreneurial experience, engaged more frequently with startup mentors, and had a larger team size. We now hypothesize why these factors may enable pivoting in response to negative feedback.

5.1.1. Entrepreneurial experience

Entrepreneurial experience refers to the development of specific human capital within the entrepreneurship domain (Ucbasaran et al., 2010). The literature suggests experienced founders possess *cognitive adaptability, or* "the ability to effectively and appropriately evolve or adapt decision policies (i.e., to learn) given feedback (inputs) from the environmental context in which cognitive processing is embedded" (Haynie et al., 2012: 238). This "entrepreneurial mindset" (McGrath and MacMillan, 2000) that comes from more exposure to entrepreneurial situations "enables entrepreneurs to think beyond or re-organize existing knowledge structures and heuristics, promoting adaptable cognitions in the face of novel and uncertain decision contexts" (Haynie et al., 2010, p. 17). In addition to this cognitive adaptability, experienced entrepreneurs may be more inclined to consider a range of alternative solutions (Gruber et al., 2008). Hence, entrepreneurial experience broadens perspective during venture development.

With this broadened perspective, we theorize experienced entrepreneurs can more easily let go of their attachment to aspects of their venture they most strongly identify with (i.e., the value proposition) and become willing to consider perspectives beyond their initial point of view. This is a similar effect evident in strategy research where board members with greater industry experience are more likely to instigate strategic change because their experience enables them to assess and react to nuanced strategy-related issues in the industry (Oehmichen et al., 2017). It is also similar to effectuation research (Sarasvathy, 2001) showing that experienced

entrepreneurs are more likely than novices to identify more potential opportunities and pay less attention to predictive information and preconceived ideas when developing a new venture (Dew et al., 2009). Thus, entrepreneurial experience enables founders to become more able and willing to deidentify with their initial ideas about value creation and allows them to pivot more easily in response to negative feedback. In contrast, startup teams with less entrepreneurial experience will not have this breadth of perspective and will be more likely to persist in their initial beliefs about value creation. As a result, having entrepreneurial experience on the startup team, as opposed to no entrepreneurial experience, prompts the team to be more able and willing to pivot the value proposition in response to negative feedback. Thus, we hypothesize:

Hypothesis 2. (H2). Entrepreneurial experience moderates the relationship between negative feedback and pivoting the value proposition, such that the likelihood of pivoting the value proposition will be higher when teams have entrepreneurial experience rather than when they do not have entrepreneurial experience.

5.1.2. Startup mentoring

As Study One suggested, frequent engagement with startup mentors may also facilitate a broader perspective and thus encourage change. Startup mentors are individuals who typically have more experience than their protégé entrepreneurs. Startup mentors help entrepreneurs by offering guidance and advice (Kram, 1988) and can help entrepreneurs break initial frames of mind and give sense to new ways of seeing (Pratt, 2000). Prior literature also suggests startup mentors may provide information that encourages the consideration of multiple possibility sets (Cohen et al., 2019; Gruber et al., 2008). And as Sariri (2022) found, angel investors were more likely than venture capitalists to encourage founders to experiment and listen to stakeholder feedback because angels tended to have more entrepreneurial experience themselves. Hence, startup mentoring may facilitate change through broadening perspective.

Building upon this literature, we argue startup mentoring encourages founders to consider a broader array of perspectives when confronting negative feedback, nudging entrepreneurs to think beyond a singular attachment, appreciate opportunities for change (e.g., Eesley and Wu, 2020), and identify less strongly with their initial ideas for value creation. This is similar to what happens in established organizations where board members often provide mentorship to the executive team and in so doing, they serve as important "conduits of counsel" (Oehmichen et al., 2017), thereby empowering executives to initiate strategic change by identifying and prioritizing threats and opportunities, and by helping to make sense of information to derive action (Thomas et al., 1993; Rajagopalan and Spreitzer, 1997). Mentors also provide founders with an "outsider view" – a more experienced outsiders perspective and assessment of a scenario – which can help an entrepreneur overcome their biased, intuitive tendencies (Kahneman, 2011), which include over attaching to an initial concept of value. Taken together, these arguments suggest that interactions with a mentor enables a founding team to broaden their perspective thereby expanding their willingness to pivot the value proposition of their business model in response to negative feedback. Hence, we expect that more engagement with startup mentors will enable founders to pivot their value propositions in response to negative feedback. We therefore hypothesize:

Hypothesis 3. (H3). Startup mentoring moderates the relationship between negative feedback and pivoting the value proposition, such that the likelihood of pivoting the value proposition will be higher when startup mentoring is high rather than when startup mentoring is low.

5.1.3. Team size

Insights from Study One suggested team size might also facilitate pivoting. A larger group entity increases subjective certainty through multiple perspectives (Ashforth et al., 2011). Larger teams also have more opportunities to peer mentor each other (Kram and Isabella, 1985), and engage in productive conflict, debate, and discussion (Fiol and Romanelli, 2012; Powell and Baker, 2017), further increasing the range of perspectives that can be considered. Co-founders prompt other co-founders to verbalize and justify points of view, rendering stakeholder feedback more salient to team decisions, encouraging a broader third-person perspective to emerge. Having this broader third-person perspective allows entrepreneurs to recognize differences among co-founders and between co-founders and other stakeholders. This may prompt entrepreneurs to expand their own narrow perspectives on aspects tied to their self-concepts and more willingly accommodate other ideas and suggestions about what might be core to their business model. Hence, team size may facilitate change through a broadened perspective.

This broadened perspective, in turn, encourages entrepreneurs to become more willing to reduce their attachment to one singular view of what could potentially drive value because founders must accommodate other points of view. This is similar to what happens in teams within established organizations who reap benefits from synthesizing informational diversity through productive task conflict. This literature suggests informational diversity reflects "differences in knowledge bases and perspectives that members bring to the group" (Jehn et al., 1999: 743). Informational diversity encourages more task conflict (Jehn and Mannix, 2001), which in turn can be "especially beneficial for creative thinking because such conflict leads members to re-evaluate the status quo and adapt their objectives, strategies, or processes more appropriately to the task" (Farh et al., 2010: 1174). Overall, these arguments suggest a larger team increases a breadth of perspective during experimentation, encouraging founders to reduce their attachment toward certain aspects of their business models to accommodate other perspectives when addressing negative feedback. As a result, founders become more willing to pivot the value proposition in response to negative feedback. We therefore hypothesize:

Hypothesis 4. (H4). Team size moderates the relationship between negative feedback and pivoting the value proposition, such that the likelihood of pivoting the value proposition will be higher when team size is large rather than when team size is small.

5.2. Quantitative data and sample

In Study Two, we test our hypotheses by gathering data on startups who participated in the I-Corps program, a specialized five-week program that helps startups explore their business prospects. The I-Corps program introduces founders to the concept of the *Business Model Canvas*, a framework for testing business model assumptions (for more information about the I-Corps program, see https://www.nsf.gov/news/special_reports/i-corps/). This context is ideal for our investigation because founders in this program were actively experimenting with their business models.[3] As part of the program, founders documented and tracked each of their business model assumptions and stakeholder interviews in real time using a standardized web-enabled reporting platform called Launchpad Central, which includes the nine BMC components (recall these nine components include [1] customer segments, [2] value proposition, [3] customer channels, [4] customer relationships, [5] revenue streams, [6] key activities, [7] key resources, [8] key partners, and [9] cost structure). Startup teams were encouraged to conduct at least 10 stakeholder interviews per week. At the conclusion of each interview, founders rated feedback received from stakeholders as positive, neutral, or negative for each business model component. At the end of each week, founders indicated whether certain business model assumptions had been "invalidated" based on this feedback by crossing out assumptions in red and generating new assumptions for that component, thus indicating a change to that specific business model component. Our measure of business model changes (detailed below) was collected directly from an online tool founders used called "Launchpad Central" where they tracked these changes as part of the program reporting. We assume co-founders agreed on what they indicated on the Launchpad Central platform because this tool was used to (symbolically) represent the collective assumptions of the team.

Our final dataset consisted of all business model assumptions, interviews, feedback ratings, and changes to each of the nine BMC components reported by the 80 startups aggregated across the entire program. Our final sample size therefore composed of observations of changes to 720 business model components (80 startups multiplied by 9 BMC components per startup). Startups participated between January 2015 and November 2020 in one of 11 cohorts. Startups consisted of about three members on average ($SD = 1.36$). There were 54 startups (67.50 %) with prior entrepreneurial experience and 52 startups (65 %) with a team size equal to or greater than three.

5.3. Quantitative measures

5.3.1. Dependent variable: business model pivots

Building on recent pivoting research (Shepherd et al., 2023; Snihur and Clarysse, 2022), we define *business model pivots* a fundamental change to a business model component. We went through the Launchpad Central database and rated the extent of change on each business model component using a five-point Likert scale from "0" (no change) to "4" (a very large change). To check interrater reliability of this measure, we asked an MBA student concentrating in entrepreneurship to rate the extent of change on each business model component across a randomly selected set of 34 teams and found good reliability for this measure ($ICC = 0.83$). We then only counted a change as a *business model pivot* when the extent of change exceeded the threshold of "3" or higher ("large change") and "0" if the change was too small (less than "3"). Prior pivoting research has also used binary empirical measures of pivoting (Camuffo et al., 2020; Furr et al., 2012). We also test five alternative measures in our Appendix F to support convergent validity.

5.3.2. Predictor variables

Each week startup founders conducted stakeholder interviews to assess business model assumptions and entered details from each interview. Across the entire program, founders indicated the amount of *negative feedback* for each assumption across BMC components based on their stakeholder interviews in real time as part of the online program reporting. Founders received varying levels of feedback across the nine business model components. During each interview, the interviewee (i.e., a potential customer) could provide information that challenged that assumption (i.e., an instance of negative feedback), across business model components. Each business model component could therefore have multiple instances of negative feedback because the negative feedback could challenge multiple assumptions on a single business model component, or multiple interviewees could challenge a single assumption (both indicating more feedback on that business model component). We aggregated the negative feedback rated across assumptions for each business model component across the entire five-week program. Hence, our negative feedback variable was continuous and indicated to what extent founders received information challenging assumptions about each business model component across the entire five-week program. Following our findings from Study One, we used a binary categorical variable "1" to indicate the *value proposition* component and "0" for *peripheral business model components*.

We define *entrepreneurial experience* broadly as specific human capital developed within the entrepreneurship domain. This includes founders with prior active involvement in the development of one or more startups as a founder or co-founder. Entrepreneurial experience was measured using a dummy code indicating whether at least one team member had prior experience setting up a company (coded as a "1"). We captured this variable using a survey-based measure distributed by the administrative team that ran the program; we triangulated this measure by checking professional online profiles (i.e., LinkedIn). We measured *startup mentoring* by

[3] We note that the concentrated nature of the program discouraged practices such as simultaneous experimentation (e.g., Andries et al., 2013). While some of the entrepreneurs in our data imagined multiple business models in the beginning of the program, they were actively encouraged to adopt what Andries et al. (2013) call a "focused commitment" approach to business model development (i.e., focusing on testing a single business model design). This allowed the entrepreneurs to maximize learning within a brief timeframe.

6.1.5. Contributions to research on team size

Third, a larger team size generates additional perspective from organizational members, which prompts members to adopt different points of view. The emergence of a "third-person perspective" appears to enable a more accurate picture of where true value lies (McMullen, 2015) as founders generate a consensus that transcends any one individual's beliefs (Ashforth et al., 2011). While many successful startups are founded by teams (Knight et al., 2020), individual entrepreneurs may be tempted to try to start something alone. This research is important because it explains why lone founders might be more resistant to changes—they have less people around them to generate alternative solutions. Our findings advance theory by providing evidence for the idea that a larger team size enables change. This insight also points to the importance of considering the role of inter-subjectivity during new venture development and opportunity enactment (Ashforth et al., 2011; Fiol and Romanelli, 2012).

Overall, these factors (entrepreneurial experience, startup mentoring, and team size) all contribute to the degree to which founders collectively step back, consider alternative courses of action, and attend to evidence when testing their business model assumptions. What is particularly novel and interesting about our results is that while prior literature suggests the factors of entrepreneurial experience, startup mentoring, and team size may independently enable change, we highlight why all three factors might reduce the singular attachment founders can have toward aspects of their venture they feel are tied to their self-concepts. We theorize these factors all contribute to a broadened perspective that expands this narrow attachment to accommodate other perspectives when experimenting with early-stage business models. Hence, we advance the literature through an integrative explanation for why these various factors enable change.

What ties these enablers together is a broader perspective (Warshay, 1962) developed intra-subjectively over time (i.e., through experience) and inter-subjectively across interactions with people (i.e., with mentors and team size). Breadth of perspective joins other important managerial cognitions relevant to designing effective business models, such as complex thinking, centralized decision-making, mental models, and a broad vision (Snihur and Clarysse, 2022). Because business models are so interdependent on other stakeholders, entrepreneurs may be able to account for the diversity of perspectives involved throughout the value chain. Breadth of perspective may be a complex cognitive process that encourages a broad vision that incorporates these diverse perspectives. We encourage future research to explore how breadth of perspective connects, detracts from, or improves with these other important cognitions.

It is also interesting to consider how our findings connect with and extend research on simultaneous experimentation (Andries et al., 2013) where founders explore multiple different business models in parallel. For example, some entrepreneurs in our data focused on a single business model schema to test during experimentation, but often would change this business model schema over time. Researchers call this a "focused commitment" approach (Andries et al., 2013). By contrast, other entrepreneurs in our program used a simultaneous experimentation approach by imagining multiple business models in the beginning of the program. However, while this latter group had generated multiple business model designs, they typically only pursued and tested one of the multiple designs because of the limited timeframe of the program (i.e., 5 weeks). That is, they initially started with multiple business models but then shifted to focusing on a single business model throughout the program. Consistent with Andries et al. (2013), the entrepreneurs within the I-Corps program were encouraged to stick with a focused commitment approach (even if they had considered multiple possible business models) because they had limited time to experiment with a small set of stakeholders and so committing to focusing on a single business model allowed them to learn quickly. We did capture the assumptions that founders made about their business models using the Business Model Canvas online tool. To the extent these business model assumptions reflect simultaneous testing of multiple business models, we would capture this variability through this control variable. However, we encourage investigations of breadth of perspective and simultaneous experimentation in future research. For example, research could explore whether and to what extent breadth of perspective might relate to entrepreneurs' willingness to explore multiple business model designs in parallel.

6.2. Limitations and future research

These findings may vary in different contexts, such as extremely resource-constrained situations where founders do not have the time or ability to experiment (Dencker et al., 2021), in corporate settings with greater resource slack (Desyllas et al., 2022), or in situations in which entrepreneurs are attempting to solve some sort of social or environmental dilemma. Future research could replicate the study with a more heterogeneous sample of startups or within other entrepreneurial contexts (e.g., corporate, social, or necessity entrepreneurship).

Although we inferred from our qualitative study that identification and psychological ownership explained why startups resist changing their value proposition, we did not measure these mechanisms directly in Study Two. Future research might capture the mechanisms identified in this study directly, potentially through experimental intervention (cf. Camuffo et al., 2020). Researchers might also test competing explanations of identity-based mechanisms. We only tested the relationship between the value proposition versus the other components of the business model, but future work might consider other contrasts between business model components if theoretically appropriate (see Davis, 2010). For example, identity-based arguments could be made for other components of the business model (e.g., customer segments, key partners, or key resources).

More research is also needed to untangle the complex interdependencies between business model components and key stakeholders as the business model evolves over time (Lanzolla and Markides, 2021; Maurer and Ebers, 2006). While it could also be possible that team members had different opinions about their business model assumptions, we did not directly capture this divergence. We believe this is not a major concern because teams were encouraged to record what they thought collectively as a team on Launchpad Central so instructors and mentors could understand their shared business model schema using the BMC. Nonetheless, we encourage researchers to explore divergence between team members' assumptions in future work.

We cannot make inferences about startup teams that are engaging in experimentation at later stages of venture development. The entrepreneurs in our data were all early-stage ventures (i.e., pre-revenue). Research suggests that pivoting could be especially detrimental at later stages of venture development (Marvel et al., 2020). This is perhaps one of the advantages of early-stage pivots to the business model and why experimentation and pivoting in response to negative feedback may be particularly important at this stage, so that ventures will need to pivot less in later stages of venture development. This idea also aligns with research on feedback and creative work that suggests creative workers engage in more elaborate changes in early stages of the creative process and shift toward smaller, incremental adjustments at later stages (Harrison and Rouse, 2015). For example, Harrison and Rouse (2015) found that creative workers responded to feedback providers with excavations (i.e., more comprehensive changes) early in the creative process and shifted toward responding with adjustments (i.e., incremental changes) in later stages. We encourage researchers to explore temporal dependencies of pivoting in early versus late stages (cf. Berends et al., 2021), and how pivoting business model components affects long-term venture performance.

7. Conclusion

Our research explored how startups experiment with and pivot their business models in response to negative feedback. Using a mixed-methods research design, we highlight founders are more likely to pivot certain aspects of their business model as opposed to other aspects of their business model. To overcome this resistance to change, startups can gain entrepreneurial experience, engage frequently with startup mentors, and expand the size of their team. We suggest these factors enable pivoting because they increase breadth of perspective, which in turn allows founders to consider more alternative solutions when facing negative feedback. Overall, we contribute to understanding the social psychological mechanisms that enable startups to pivot different aspects of their emerging business model schemas during early-stage experimentation.

CRediT authorship contribution statement

Devin Burnell: Conceptualization, data collection, data analysis, writing – original draft
Regan Stevenson: Conceptualization, quantitative methodology, writing – review & editing
Greg Fisher: Conceptualization, qualitative methodology, writing – review & editing

Data availability

The data that has been used is confidential.

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Appendix A. Supplementary online appendix

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jbusvent.2023.106314.

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