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INNOVATION-DRIVEN APPROACHES TO TALENT MANAGEMENT IN STARTUPS

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ABSTRACT

Startups frequently face challenges in attracting top talent due to their limited stability, resources, and brand recognition compared to established firms. However, effectively communicating their potential for growth and innovation can significantly enhance their appeal as employers. This study investigates how startups can leverage clear and strategic messaging about product innovation and future prospects to attract job seekers. A survey of business students was conducted, in which participants evaluated startups based on descriptions emphasizing growth potential and product innovativeness. The findings reveal that startups are perceived as more attractive employers when they explicitly communicate their vision for growth and highlight the novelty and uniqueness of their offerings. Moreover, perceived product innovativeness strongly influences job seekers' interest and positive evaluation of the firm. These results suggest that entrepreneurs seeking to attract high-quality talent should prioritize transparent, compelling communication of their company's innovative capabilities and long-term vision to strengthen their employer brand and competitive positioning in the labor market.

Keywords: *Startup Recruitment; Talent Attraction; Employer Branding; Product Innovativeness; Perceived Growth Trajectory; Job Seeker Perceptions; Entrepreneurial Hiring; Innovation Signaling; New Venture Employment; Signaling Theory.*

INTRODUCTION

Human capital is one of the most critical assets for startups, as it directly influences their survival and long-term growth (Cardon & Stevens, 2004; Agarwal et al., 2016; Unger et al., 2011). Attracting skilled employees is a major challenge for new ventures, primarily because they face intense competition from established firms in the labor market (Greer et al., 2016; Mayson & Barrett, 2006). Compared to large corporations, startups often struggle to recruit top talent due to their lower brand recognition (Williamson et al., 2002), higher business risks associated with their early-stage nature (Stinchcombe, 1965), and increased vulnerability to economic downturns (Fort et al., 2013). These challenges place startups at a disadvantage in the war for talent, making it essential for them to adopt strategic approaches to recruitment.

Despite the importance of recruitment for new ventures, research on how startups can effectively attract job seekers remains underdeveloped. While previous studies have explored various factors that influence applicant attraction—such as the entrepreneur's leadership behavior (Hubner et al., 2021), team climate (Moser et al., 2017), and flexible work environments (Tumasjan et al., 2011)—less attention has been given to how startups should communicate their unique attributes to potential employees. Unlike established companies, where employer branding is often

supported by strong reputations and well-defined corporate identities, startups must actively persuade job seekers through targeted recruitment messaging. This makes effective communication a crucial factor in shaping applicant perceptions and influencing job choice decisions.

In this study, we examine how startups can use recruitment communication strategies to enhance applicant attraction. Specifically, we investigate the role of communicated product innovativeness (i.e., how entrepreneurs verbally convey the uniqueness of their product or service) and perceived trajectory (i.e., job seekers' evaluation of the startup's growth potential). These two factors are particularly relevant because innovation and long-term growth are key considerations for job seekers evaluating career opportunities in startups. Unlike established firms, startups often lack extensive public information regarding their financial stability, career progression opportunities, and market position. Therefore, job seekers must rely on the signals provided by entrepreneurs through verbal and nonverbal communication to assess the attractiveness of a venture.

Building on signaling theory (Spence, 1973) and persuasive communication research (Cialdini, 2001), we propose that startups can attract job seekers by clearly communicating their product's innovativeness and their company's future potential. Furthermore, we examine how the perceived innovativeness of a product mediates the relationship between communicated product innovativeness and applicant attraction. In doing so, we address a key gap in the literature by shifting the focus from what makes a startup attractive to how startups can effectively convey their attractiveness to job seekers.

To test our hypotheses, we conducted a survey-based experiment with business students evaluating different startup recruitment messages. Participants assessed the attractiveness of startups based on descriptions of their product innovation and future trajectory. We used generalized structural equation modeling (GSEM) to analyze the relationship between communicated product innovativeness, perceived trajectory, and applicant attraction. Our findings suggest that applicant attraction increases when startups effectively communicate product innovativeness and signal strong future growth. Additionally, our results indicate that perceived product innovativeness plays a mediating role in this process, meaning that job seekers are more likely to be attracted to startups if they believe the startup's product is genuinely innovative.

This study contributes to multiple streams of research. First, it advances the literature on startup recruitment by introducing a communication-based perspective, emphasizing that how a startup conveys its strengths is as important as what it offers. Second, it extends research on persuasive communication in entrepreneurship by highlighting the interplay between verbal messages (e.g., communicated product innovativeness) and job seekers' perceptions. Finally, it provides practical implications for entrepreneurs, suggesting that effective recruitment messaging can help startups overcome their inherent disadvantages in the talent market.

2. Theoretical Framework

This section explores persuasive communication in the context of recruitment, particularly within the startup ecosystem. We begin by examining how new ventures convey recruitment messages to potential applicants. Then, drawing on theories of persuasive communication and applicant attraction, we discuss how different elements—such as the startup's product innovativeness and the entrepreneur's passion—influence job seekers' perceptions.

In established recruitment literature, nonverbal communication plays a crucial role in enhancing the persuasive impact of a message (Birdwhistell, 1970; Burgoon et al., 1989; Ekman, 1993). While traditional firms may rely on their brand reputation, structured processes, and financial stability to attract talent, startups must use other persuasive techniques to compete for top candidates. Entrepreneurs, as the face of their ventures, often play a central role in delivering recruitment messages, making their communication style particularly important.

In the following sections, we focus on the recruitment messages sent by new venture entrepreneurs. First, we explore the connection between communicated product innovativeness and applicant attraction, leading to our first

hypothesis. Next, building on insights from persuasive communication in recruiting, we develop hypotheses regarding the influence of an entrepreneur's nonverbal expressions of passion on applicant attraction. Finally, we examine the interaction between perceived trajectory and product innovativeness, analyzing how these factors jointly impact job seekers' willingness to join a startup.

2.1 Persuasive Communication in Recruitment

Applicant attraction is a persuasive process in which organizations craft recruitment messages to shape job seekers' perceptions, encouraging them to apply for roles and accept job offers (Roberson et al., 2005). This process is particularly significant for startups, which may lack strong employer branding and must rely on persuasive communication to compete with established firms in attracting top talent.

Recruitment messages are typically communicated through two main channels: textual and spoken. Textual communication consists of written content, often supplemented with images, that job seekers can access through company websites, online job postings, and professional networking platforms such as LinkedIn (Kraichy & Chapman, 2014; Walker et al., 2009). Startups leverage these platforms to increase visibility and reach a broader audience. However, textual communication alone is often less impactful than spoken communication in conveying persuasive recruitment messages (Allen et al., 2004).

Spoken communication, whether conducted in-person or virtually, integrates both verbal and nonverbal elements, making it a more engaging and persuasive medium (Burgoon et al., 2021). Verbal communication involves the spoken words used by a recruiter or entrepreneur to present job opportunities, company vision, and work culture. It appeals to job seekers' reasoning and helps legitimize the startup's mission, explain its products/services, and establish credibility (Giorgi & Weber, 2015; Cornelissen, 2012; Garud et al., 2014). Entrepreneurs, in particular, rely on compelling narratives and logical arguments, such as growth potential and innovation, to attract prospective employees (Roberson et al., 2005).

However, verbal communication rarely functions in isolation. Even in written formats, nonverbal elements—such as tone, style, structure, and emphasis—significantly influence how recruitment messages are perceived (Duncan, 1969; Burgoon et al., 1989). In startup recruitment, these implicit cues are especially important in shaping employer branding through innovative documents, such as creatively designed job descriptions, personalized outreach emails, and visually engaging recruitment materials. By embedding energy, clarity, and cultural cues into written communication, startups can signal passion and purpose. This textual expressiveness helps reinforce the startup's vision, making the opportunity feel more authentic and compelling to potential applicants.

For startups, where product innovativeness and entrepreneur passion are key differentiators, effective recruitment messaging—both verbal and nonverbal—can significantly influence whether job seekers choose to join a new venture over an established company.

Research on nonverbal communication underscores its vital role in social interactions and its power to convey universally understood relational meanings within a specific context (Burgoon, Buller, & Woodall, 1996; Floyd & Ebert, 2003). Individuals often form rapid impressions of others based on nonverbal cues (Albright, Kenny, & Malloy, 1988), and even brief exposure to such behaviors can lead to surprisingly accurate judgments (Ambady et al., 2000). In the realm of recruitment, nonverbal communication significantly influences how individuals interpret messages about organizations and roles, shaping perceptions of both recruiters and applicants (Ambady et al., 2000). Prior studies have shown that recruiters' judgments and hiring decisions are impacted by nonverbal behaviors (Burgoon et al., 1985; Howard & Ferris, 1996; McElroy et al., 2014; Woodzicka, 2008), and similar dynamics play out in entrepreneurial settings, where expressive cues from founders can sway investor decisions (Chen et al., 2009; Clarke et al., 2019; Pollack et al., 2012).

In the context of startups competing for top talent, persuasive communication is rarely confined to verbal content alone; rather, it

involves a nuanced interplay between verbal clarity and implied tone or intent, even in written documents. Recruitment messages—especially from emerging ventures—must rely on both **innovative verbal strategies and the inferred nonverbal elements within text-based materials** to stand out and attract attention. Drawing on nonverbal communication theory (Birdwhistell, 1970; Burgoon et al., 1989; Ekman, 1993), it's evident that nonverbal elements—even when conveyed indirectly through language choice, structure, and emphasis in documents—still play a crucial role in persuasion and message effectiveness.

Nonverbal elements in written communication function in two key ways. First, they **reinforce and animate verbal messages** through stylistic cues and expressive language. The tone, rhythm, and structure of written recruitment materials can mirror the energy and clarity of spoken communication, helping startups convey enthusiasm, cultural fit, and organizational personality. This form of textual expressiveness helps signal conviction and passion—qualities that are especially important for startups attempting to differentiate themselves in a competitive labor market (Ambady & Rosenthal, 1992; Huang & Pearce, 2015). Additionally, emotionally charged wording, strategic use of punctuation, and narrative storytelling in documents can evoke affective responses, capturing potential applicants' attention and enhancing message retention (Hansen & Hansen, 1988; Niedenthal & Kitayama, 1994; Öhman et al., 2001). Given that emotions are strong drivers of cognitive engagement (Steigenberger & Wilhelm, 2018), carefully crafted recruitment materials are more likely to resonate with and persuade talent (Bower & Forgas, 2001; Forgas & George, 2001).

Second, nonverbal communication in documents conveys **implicit signals about personality, values, and organizational culture** (Krauss et al., 1996; Marsh et al., 1997). These signals, embedded in linguistic style and presentation, shape applicants' perceptions of a startup's identity and mission. For example, a formal and jargon-heavy message might suggest rigidity or hierarchy, whereas a casual, enthusiastic tone with innovative formatting could project agility, openness, and a forward-thinking ethos (Burgoon et al., 1990; Laver, 1999). In this way, written materials serve not only to inform but also to **perform a signaling function**, helping startups differentiate themselves and appeal to candidates aligned with their vision.

Thus, even in document-based communication, nonverbal elements embedded in textual style and structure play a critical role in attracting talent. Startups that innovatively design their written recruitment materials to express enthusiasm, cultural uniqueness, and purpose-driven messaging can gain a competitive edge in the war for talent.

In the context of new ventures competing for talent, effectively leveraging nonverbal communication can be a critical differentiator. Since startups often lack the brand recognition and stability of established firms, their ability to attract applicants may depend on how convincingly they communicate their vision, culture, and passion. Entrepreneurs who exhibit high levels of enthusiasm and confidence through nonverbal cues may be more successful in persuading potential candidates to consider job opportunities within their ventures.

2.2 The Relationship Between Verbally Communicated Product Innovativeness and Applicant Attraction

This section explores how new venture entrepreneurs use verbal communication to convey persuasive recruitment messages, focusing specifically on the relationship between communicated product innovativeness and applicant attraction.

A job seeker's willingness to join an organization is often influenced by perceptions of the company's products or services (Backhaus & Tikoo, 2004; Moroko & Uncles, 2008). Organizations that are perceived as offering more innovative products or services tend to be seen as more attractive employers (Sommer et al., 2017). Product innovativeness signals a company's future market potential and its ability to introduce further innovations (Keller, 2012). Since job seekers consider an employer's financial health and growth prospects, they are naturally drawn to companies with strong market performance, as weaker performance

could lead to job instability (Ouimet & Zarutskie, 2014).

In the case of new ventures, however, job seekers often lack access to comprehensive information about the company's products and services. Unlike established firms, startups may not have widespread recognition or a market track record that applicants can rely on to assess product innovativeness. Therefore, new venture entrepreneurs must actively communicate their products' uniqueness and innovative features through verbal recruitment messages. These messages should highlight key aspects such as customer needs being addressed, product or service features, and differentiators from competitors.

However, individual job seekers may interpret the same information differently based on their backgrounds and cognitive processes (Stanovich, 1999). Research suggests that while people's assessments of product innovativeness may correlate to some extent, they are rarely identical. For instance, managers and consumers often rate the same product's innovativeness differently (Andrews & Smith, 1996; Sethi et al., 2001). Even job seekers with similar reasoning abilities may perceive product innovativeness differently due to varying levels of industry knowledge, prior experience, and familiarity with the technology involved (Kunz et al., 2011). A candidate who understands the technology behind a new venture's offering may perceive it as more innovative than someone with limited technical knowledge.

Given these variations in perception, we propose that the effectiveness of verbally communicated product innovativeness in attracting applicants is mediated by how job seekers subjectively perceive the product's novelty. This leads to the following hypothesis:

H1: *Communicated product innovativeness is positively related to applicant attraction to a new venture, and this relationship is mediated by perceived product innovativeness*

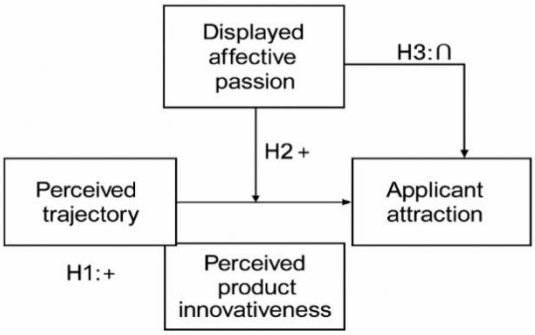
2.3 The Interaction Between Verbally Communicated Product Innovativeness and Nonverbal Cues Embedded in Written Communication

Building on nonverbal communication theories that emphasize the significance of both what is said and how it is said (Burgoon et al., 1990), we argue that job seekers' attention to and interpretation of recruitment messages depend not only on the verbal content but also on the subtle nonverbal cues embedded in the written presentation. In the context of startup recruitment through documents, we focus on the **nonverbal display of affective passion**—conveyed through expressive language, tone, formatting, and overall document design.

When job seekers read a recruitment message or company profile, they process both the information presented and the emotional undertone inferred from the style of communication (Li et al., 2017). Research in nonverbal and emotional communication suggests that emotionally engaging messages elicit stronger cognitive and affective responses than neutral ones (Bower & Forgas, 2001; Ekman, 1993). Therefore, when startups describe their innovative products or services using enthusiastic, vivid language and compelling narrative techniques, these textual signals of passion can reinforce the perception of innovativeness by grabbing readers' attention and making the message more memorable and impactful (Ambady & Rosenthal, 1992; Damasio, 2010).

This affective tone in written communication also affects how deeply job seekers process the recruitment content. Enthusiastic and purpose-driven messaging increases the likelihood that applicants will not only read but also reflect on the material, evaluating the innovation being communicated with greater interest and scrutiny (Allred et al., 1997). As a result, the passion conveyed through written cues strengthens the connection between what is said (communicated product innovativeness) and how it is perceived (perceived product innovativeness), ultimately influencing applicant attraction.

Fig. 1 Conceptual model



H2: The affective passion embedded in a startup's written recruitment materials positively moderates the relationship between communicated product innovativeness and perceived product innovativeness

2.4 The Relationship Between Nonverbal Displays of Affective Passion in Documents and Applicant Attraction

Nonverbal communication theories (Birdwhistell, 1970; Burgoon et al., 1989, 1990) suggest that beyond reinforcing verbally communicated content, nonverbal elements—even in written form—convey critical implicit information to readers. In startup recruitment documents, cues such as emotionally charged language, personalized tone, storytelling elements, and bold visual formatting can signal entrepreneurial passion and dedication, which directly shape applicant attraction.

Job seekers often associate certain attributes—such as energy, confidence, and commitment—with high-potential startup founders (Elenurm et al., 2014; House et al., 2002; Murnieks et al., 2019). Passion, in particular, is a key signal of entrepreneurial drive and resilience (Cardon et al., 2009a, 2009b; Stroe et al., 2019). Even in the absence of face-to-face interaction, startups can project this passion through carefully crafted recruitment materials that reflect enthusiasm, urgency, and belief in the venture's purpose. Such cues signal dedication and vision, reinforcing the

perception that the startup is dynamic, forward-thinking, and worthy of commitment (Bierly et al., 2000; Cardon et al., 2009a, 2009b, 2013; Murnieks et al., 2014).

Commitment plays a crucial role in overcoming obstacles in the entrepreneurial journey and ensuring a venture's long-term success (Moore, 1986; Erikson, 2002; Klofsten, 1994). Consequently, job seekers may interpret an entrepreneur's passionate display as an indicator

of promising venture performance, making the startup appear more attractive as a potential employer.

However, while moderate levels of affective passion can enhance applicant attraction, excessive displays of passion may have the opposite effect. Job seekers may perceive intense passion as a sign of rigidity, resistance to feedback, or inflexibility (Cardon, 2008; Thorgren & Wincent, 2013; Vallerand et al., 2003). Extreme emotional intensity may also negatively impact trustworthiness and approachability (Ho & Pollack, 2014; Philippe et al., 2010). Furthermore, overly passionate entrepreneurs may exhibit blind persistence, irrational escalation of commitment, or strained workplace relationships, which can ultimately harm the venture's stability (Branzei & Zietsma, 2003; Vallerand et al., 2007).

Thus, we propose that there is an inverted U-shaped relationship between affective passion and applicant attraction: passion increases applicant attraction up to a certain threshold, beyond which excessive displays of passion may deter potential job seekers.

H3: There is an inverted U-shaped relationship between the affective passion displayed by an entrepreneur while presenting their new venture's products/services and applicant attraction to the venture.

3 Methods

3.1 Participants and Procedures

To test our hypotheses, we exposed study participants to document-based recruitment stimuli and subsequently asked them to complete three separate questionnaires. Their responses were used to construct measures for the key variables examined in the study.

The participants consisted of final-term business students enrolled in a Bachelor of Business Administration (BBA) program at a business school. All participants were either actively seeking employment or preparing to enter the job market. The use of student samples is a well-established practice in empirical research on applicant attraction (Allen et al., 2007; Allred et al., 1997; Rau & Hyland, 2002; Roberson et al., 2005). Importantly, for this study, these students were not merely a convenience sample but a theoretically relevant group—representing future talent pools for new ventures and startups (Grégoire et al., 2019; Hsu et al., 2017).

In line with previous studies (Davis et al., 2017; Elpers et al., 2003, 2004), we used stimuli drawn directly from the context under investigation. These stimuli took the form of **text-based recruitment documents**, specifically descriptions of startups presenting their value propositions and highlighting their use of innovation in products and services. We focused on startups from Pakistan's entrepreneurial ecosystem that were recently founded and actively recruiting. Since these ventures did not have video-based recruitment materials, we created structured, written descriptions to capture the essence of their product innovativeness and employer appeal.

To ensure representativeness, we selected startups across a variety of industries—including fintech, e-commerce, healthtech, agritech, and SaaS—providing a broad view of innovation-driven ventures. Each written description included information on the startup's target customer needs, product or service features, and competitive differentiation, enabling participants to assess the level of perceived innovation.

The administration of the study followed a structured format. After a short briefing, participants received the first questionnaire, followed by exposure to multiple startup recruitment documents. To reduce fatigue and maintain engagement, each participant reviewed a limited number of descriptions, with the order randomized to control for order effects (Elpers et al., 2004). After reading each description, participants evaluated the startup's attractiveness as a potential employer and indicated their willingness to consider a job offer from the company.

Once all descriptions had been reviewed, participants submitted the first questionnaire and proceeded to complete two additional ones. The second questionnaire collected demographic data and information on participants' personal characteristics, while the third measured their perception of product innovativeness and assessed their familiarity with the startup's industry or technology domain. Because this final questionnaire was administered after a short time gap, each evaluation was preceded by a brief three-line refresher description of the startup's offering.

Prior to full-scale data collection, we conducted a pilot test with three research assistants of similar age to our main participant group. The pilot aimed to validate the clarity and effectiveness of the three-line descriptions and to determine whether the survey length was manageable. Results confirmed both the accuracy of the materials and the feasibility of the research design.

The data collection yielded a sample of [insert number] startup-participant observations, offering valuable insights into how startups can use innovation-driven, document-based communication strategies to attract top talent in a competitive labor market.

3.2 Measures

Dependent Variable: Applicant Attraction to the Venture

The dependent variable captures the extent to which participants were interested in pursuing employment with the featured startup ventures. We measured Applicant Attraction using three items adapted from widely used applicant attraction scales (Harris & Fink, 1987; Kammeyer-Mueller & Liao, 2006; Turban & Dougherty, 1992; Turban et al., 1998). These items assessed participants' (1) willingness to work for the startup, (2) perception of the

startup's attractiveness as an employer, and (3) general interest in applying for a position. Participants responded using a 7-point Likert scale. The internal consistency reliability of the scale in our study was high (Cronbach's α = 0.92). We computed the Attraction score for each participant as the average of their responses to these three items.

Independent Variable: Displayed Affective Passion

As our study was based on document-based recruitment messages rather than video materials, we adapted the operationalization of Displayed Affective Passion accordingly. Instead of assessing nonverbal behaviors such as facial expressions or body movements, two independent raters (one researcher and one research assistant) evaluated the expressiveness and emotional intensity conveyed through the written recruitment documents. This adaptation was based on the affective passion scale developed by Chen et al. (2009), which has been validated in entrepreneurship research (e.g., Davis et al., 2017; Mitteness et al., 2012).

One item from the original scale—related to "energetic body movements"—was excluded due to the absence of nonverbal visual cues. The remaining five items assessed how strongly the recruitment documents communicated passion, enthusiasm, and emotional engagement with the startup's vision and mission. Ratings were provided on a 7-point Likert scale. The internal consistency reliability of the ratings was high (α = 0.83 and 0.91 for the two raters), and inter-rater agreement was strong (r = 0.952, p < 0.000). We computed the Perceived Trajectory variable as the average of the combined item ratings across both evaluators.

Independent Variable: Communicated Product Innovativeness

To capture how innovative the startup's offerings appeared based on their written descriptions, we employed external evaluations from experts in innovation and entrepreneurship. Using the consensual assessment technique (Amabile et al., 1996; Grant & Berry, 2011), five independent experts—each with experience evaluating startups or working within the innovation space—assessed the Communicated Product Innovativeness based solely on the document-based recruitment materials.

Experts were presented with identical startup descriptions and asked to evaluate the innovativeness of each venture's product or service using a five-item scale developed by Lee and Colarelli O'Connor (2003), which focuses on product novelty, uniqueness, and differentiation from market alternatives. The scale has been widely validated in innovation studies (Cronbach's α = 0.77–0.96). Inter-rater reliability for expert evaluations in our study was strong (r = 0.854, p < 0.000). The final Communicated_Prod_Inno score was computed as the mean of the ratings provided by the expert panel.

Mediator Variable: Perceived Product Innovativeness

Perceived Product Innovativeness was measured from the perspective of the study participants. After reading each startup's description, participants rated the perceived innovativeness of the product or service using the same five-item scale used by expert evaluators (Lee & Colarelli O'Connor, 2003). Items assessed perceived novelty, distinctiveness, and market differentiation. Responses were given on a 7-point Likert scale. The internal consistency reliability of this scale was high (α = 0.84). We calculated Perceived_Prod_Inno for each startup-participant pair by averaging the responses across all five items.

Table 2 presents the factor loadings for all the items used to construct the four variables outlined above.

Table 1: Descriptions of the Variables

Variables	Descriptions
Dependent Variable	
Attraction	Average of the answers provided by the focal participant to the following three questions: (i) "How attractive is this venture as an employer for you?" (Answers were provided using a five-point scale from 1=not attractive to 5=very attractive); (ii) "How likely would you be to accept a job if offered by this venture?" (Answers were provided using a five-point scale from 1=not likely to 5=very likely); (iii) "How likely is it that this venture would be your first choice as an employer?" (Answers were provided using a five-point scale from 1=not likely to 5=very likely)
Independent Variables	
Perceived Trajectory	Average of the participant's evaluations of the following five items: (i) The startup effectively communicates a compelling vision for future growth. (ii) The startup's market position suggests strong potential for expansion. (iii) The startup provides clear indications of career progression opportunities for employees. (iv) The startup's leadership conveys confidence in scaling the business successfully. (v) The startup's funding, partnerships, or customer base suggest long-term stability and growth. Each item was rated using a five-point scale from 1=strongly disagree to 5=strongly agree.
Communicated_Prod_Inno	Average of the experts' evaluations of the following five items: (i) the technology this product/service incorporates is new to me, (ii) the benefits this product/service offers are new to me, (iii) the product/service features are novel/unique to me, (iv) this product/service introduced many completely new features to the market, and (v) this product/service offers dramatic improvements to existing product/service features. Each item was rated using a five-point scale from 1=strongly disagree to 5=strongly agree.
Mediator	
Perceived_Prod_Inno	Average of participant's evaluations of the following five items: (i) the technology this product/service incorporates is new to me, (ii) the benefits this product/service offers are new to me, (iii) the product/service features are novel/unique to me, (iv) this product/service introduced many completely new features to the market, and (v) this product/service offers dramatic improvements to existing product/service features. Each item was rated using a five-point scale from 1=strongly disagree to 5=strongly agree.
Control Variables	
Participant_Gender	Dummy equals one for female participants and zero for male participants.
Participant_Age	Age (in years) of the participant.
New_Ventures_Appeal	Participant's answer to the question: "If you received two similar job offers (=same activities and salary), one from an established company and one from a new venture, which one would you most likely accept?" Answers were provided using a five-point scale from 1=the established company to 5=the new venture.
Student_Avg_Mark	Average of the marks the participant student obtained in the Master of Science courses he/she attended. The variable ranges between 18 and 30.
Entrepreneur_Age	Age (in years) of the entrepreneur.
Startup_Attractiveness	The measure of the entrepreneur's physical attractiveness. Following prior studies, eight graduate students rated the overall physical attractiveness of each entrepreneur using a five-point scale from 1=physically very unattractive to 5=physically very attractive. The internal consistency of the ratings was significant ($r=.890$, $p<0.000$, $n=12$), justifying the use of the mean ratings.
Venture_Familiarity	Dummy equals one if the participant already knew the entrepreneur or had already heard about the venture and its activity, and zero otherwise.

Problem_Familiarity	Participant assessment of familiarity with the problem/need addressed by the venture. Evaluated using a five-point scale from 1 (=not familiar) to 5 (=very familiar).
Industry_Attractiveness	Participant assessment of the attractiveness of the industry where the venture operates. Assessed using a five-point Likert scale from 1 (=not willing to work in this industry) to 5 (=very willing to work in this industry).

Control Variables

The models outlined in Section 4 include various control variables commonly used in applicant attraction research. Further details on how these controls were computed are provided in Table 1.The second set of controls includes three video-specific factors related to the entrepreneurs featured in the recorded videos. Specifically, we controlled for Entrepreneur_Age and Entrepreneur_Attractiveness, which capture individual characteristics of the entrepreneur presenting the startup. The age of the entrepreneur may have mixed effects on applicant attraction. On one hand, based on homophily theory (McPherson et al., 2001), young job seekers may be more drawn to younger entrepreneurs due to similarity. On the other hand, older entrepreneurs may be perceived as more experienced, making them more attractive as employers. Additionally, we controlled for Entrepreneur_Attractiveness, as research suggests that a communicator's physical attractiveness can enhance persuasiveness (Chaiken, 1979).

Item	Attraction	Perceived_ Trajectory	Communicated Prod_Inno	Perceived Prod_Inno
Attraction_item1	0.90			
Attraction_item2	0.95			
Attraction_item3	0.92			
Perceived_Trajectory_item1		0.87		
Perceived_Trajectory_item2		0.88		
Perceived_Trajectory_item3		0.75		
Perceived_Trajectory_item4		0.79		
Perceived_Trajectory_item5		0.90		
Communicated_Prod_Inno_item1			0.93	
Communicated_Prod_Inno_item2			0.90	
Communicated_Prod_Inno_item3			0.86	
Communicated_Prod_Inno_item4			0.97	
Communicated_Prod_Inno_item5			0.83	
Perceived_Prod_Inno_item1				0.68
Perceived_Prod_Inno_item2				0.78
Perceived_Prod_Inno_item3				0.85
Perceived_Prod_Inno_item4				0.85
Perceived_Prod_Inno_item5				0.78
Eigenvalue	2.57	3.54	4.41	3.14
Variance explained	76%	71%	98%	73%

Table 2 Factor loadings of the scales used

We did not control for entrepreneurs' gender or race, as all the entrepreneurs featured in the videos were Caucasian males. To account for potential variations in the stimuli, we also controlled for Video_Length.

The third set of control variables accounts for additional factors that may influence applicant attraction to innovative startups. One important factor is **Venture Familiarity**, as prior research has shown that organizational familiarity plays a significant role in shaping job seekers' preferences (Uggerslev et al., 2012). Participants who were already familiar with a particular startup may have rated it more favorably.

We also included **Problem Familiarity** as a control, reflecting participants' prior knowledge or understanding of the problem or customer need the startup aims to solve. This is important because job seekers who resonate with the problem being addressed may be more inclined to find the opportunity appealing. Additionally, we controlled for **Industry Attractiveness**, which captures participants' subjective evaluation of how appealing the startup's industry is. Prior research indicates that job seekers often have preferences for certain industries or technologies, which can shape employer attractiveness (Wilden et al., 2010).These controls allowed us to isolate the effects of communicated innovation and affective passion from background influences related to participants' interests and familiarity with specific ventures or industries.

Multicollinearity Check

To evaluate the possibility of multicollinearity among our explanatory variables, we conducted a Variance Inflation Factor (VIF) analysis using an ordinary least squares (OLS) regression, with **Applicant Attraction** as the dependent variable. The mean VIF was **1.07**, and the highest individual VIF was **1.35**. Both values fall well below standard thresholds for multicollinearity concerns (commonly cited thresholds are 6 or 10; Hair et al., 2009: 193). These results indicate that multicollinearity was not an issue in our dataset.

Table 3 presents **summary statistics** for the variables included in the study, while Table 4 provides the **correlation matrix.**

Table 4 Correlation matrix

Vasi	1	2	3	4	5.	6	7	8	9	10	11	12	13	14
1	0.05	-	0.18*	-	0.09	0.31*	-0.11	0.42*	0.21*	0.29*	0.05	-	-0.08	1.00
2	0.46*	0.22*	0.01	0.19*	-0.05	-	0.15	1.00	0.09	-0.04	0.11*	-	-0.02	
3	-	-0.09	0.04	0.06	-0.12	0.08	1.00		-	-	-0.06	-	0.33*	
4	0.20*	-0.02	0.07	-	0.17*	1.00			0.24*	0.06	-	-0.04	-0.05	
5	0.00	0.02	-0.10	-	1.00				0.05	-0.01	-	0.12*	-	
6	0.02	-	0.13	1.00					-	-0.05	-0.01	0.03	0.10	
7	0.03	-0.05	1.00						-0.02	0.10	0.15*	-	-0.01	
8	0.01	1.00							0.06	-0.01	0.00	-0.02	0.07	
9	1.00								0.09	0.12*	-0.03	-0.08	-	
10									-	-0.04	0.25*	-	1.00	
11									-0.07	-	-	1.00		
12									-0.05	0.16*	1.00			
13									0.19*	1.00				
14									1.00					

3.3 Statistical Procedures

Given that both the dependent variable (Applicant Attraction) and the mediator (Perceived Product Innovativeness) were measured using responses from the same participants, we took appropriate steps to address potential common method bias, which could otherwise distort the relationships among key variables (Podsakoff & Organ, 1986; Podsakoff et al., 2003).

To reduce the likelihood that participants' responses to one part of the survey would influence their answers to another, we applied procedural remedies by temporally separating the collection of data for the dependent and mediator variables. Specifically, data on Applicant Attraction were gathered during the initial phase of the study via the first questionnaire, whereas Perceived Product Innovativeness was measured at the end of the session using the third questionnaire, after a time gap and intervening tasks. This separation aimed to limit participants' ability to draw connections between their earlier and later responses, thus minimizing response bias.

Table 3 Means and standard deviations of dependent and explanatory variables

Variable	Mean	Std. Dev	Min	Max
Attraction	4.021	1.215	1.000	7.000
Perceived_Trajectory	4.105	1.372	2.000	6.500
Communicated_Prod_Inno	4.752	0.881	3.100	6.100
Perceived_Prod_Inno	4.289	1.114	1.500	6.900
Participant_Gender	0.312	0.463	0.000	1.000
Participant_Age	23.987	0.745	22.500	26.000
New_Ventures_Appeal	3.212	1.447	1.000	6.800
Student_Avg_Mark	26.834	1.519	23.100	30.000
Entrepreneur_Age	34.121	5.934	29.000	45.000
Entrepreneur_Attractiveness	3.574	1.221	1.800	5.100
Video_Length	168.340	29.105	135.000	210.000
Venture_Familiarity	0.121	0.327	0.000	1.000
Problem_Familiarity	3.691	1.525	1.000	7.000
Industry_Attractiveness	4.135	1.632	1.000	7.000

We also applied statistical techniques to test for common method variance. First, we conducted Harman's single-factor test, which showed that no single factor accounted for the majority of the variance in the data. This suggests that common method bias was not a significant threat (Podsakoff & Organ, 1986).

To strengthen this conclusion, we ran a confirmatory factor analysis (CFA) to assess the fit of a single-factor model, where all survey items loaded onto one factor. The results revealed poor model fit (CFI: 0.57; TLI: 0.40; RMSEA: 0.31; SRMR: 0.17), supporting the absence of a dominant common factor and confirming the distinctiveness of the constructs measured.

Finally, we applied the common latent factor technique using AMOS software, as recommended by Podsakoff et al. (2003). We compared a two-factor model—representing values of 0.20 and 0.15, respectively. These values justified the use of a multilevel modeling approach.

Applicant Attraction and Perceived Product Innovativeness—to a model that included an additional common latent factor. The standardized regression weights across the models differed by less than 0.2, indicating that common method variance did not materially affect our study's findings.

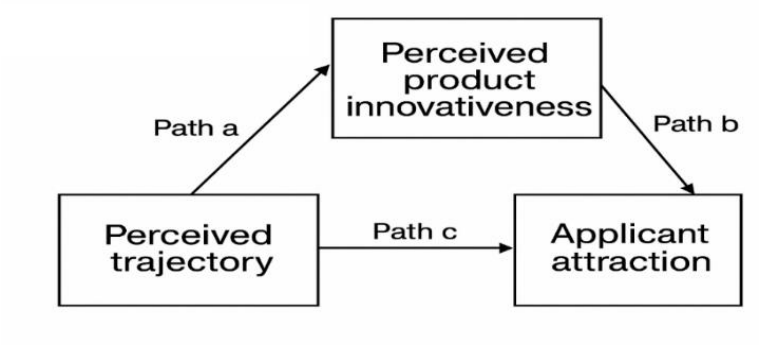
These steps provide strong evidence that the observed relationships in our data were not significantly influenced by common method bias, allowing for greater confidence in the validity of the results.

Since the dataset involved nested data structures, where individuals evaluated Attraction based on the perceived and actual characteristics of both ventures and entrepreneurs, the necessity of multilevel modeling techniques was assessed.

Following Heck et al. (2010), the variances in Attraction and Perceived_Prod_Inno were partitioned into within-group and between-group components, with intra-class correlation (ICC). For hypothesis testing, structural equation modeling (SEM) was used to estimate two simultaneous equations: the first modeling the path from Communicated_Prod_Inno (independent variable) to Perceived_Prod_Inno (mediator), and the second modeling the path from Perceived_Prod_Inno to Attraction (dependen variable). Given that Perceived_Prod_Inno and Attraction are double-censored variables, the Generalized Structural Equation Modeling (GSEM) technique in Stata was applied, using a Gaussian link function for both equations.

As a robustness check, the control variables were excluded from the first equation, and the model was re-estimated. The results remained consistent, confirming the reliability of the findings.

Fig. 2 Graphical representation of the mediation



The results indicate a positive and significant mediation effect, as the bias-corrected 99 percent confidence interval does not include zero, with a lower limit of 0.102 and an upper limit of 0.172. This confirms that perceived product innovativeness mediates the relationship between communicated product innovativeness and applicant attraction.

4 Results

The study examines whether perceived product innovativeness mediates the relationship between communicated product innovativeness and applicant attraction. Before conducting the GSEM estimates, a mediation analysis was performed using the bootstrap procedure recommended by Preacher and Hayes (2004, 2008). By drawing 500 bootstrap samples, the confidence interval of the indirect relationship between communicated product innovativeness and applicant attraction through perceived product innovativeness was assessed.

To test the hypotheses, a two-step approach was employed, following the recommendations of Anderson and Gerbing (1988). First, a confirmatory factor analysis (CFA) was conducted to validate the measurement model, which showed a good fit to the data (CFI = 0.95; TLI = 0.85; RMSEA = 0.07; SRMR = 0.03). After confirming the measurement model, the hypotheses were tested using generalized structural equation modeling (GSEM). The results show that communicated product innovativeness positively predicts perceived product innovativeness (b = 0.40, p = 0.000), which in turn positively influences applicant attraction (b = 0.39, p = 0.000). The direct effect of communicated product innovativeness on applicant attraction is not significant, confirming an indirect-only mediation (Zhao et al., 2010). These findings support Hypothesis 1, as they indicate that the influence of communicated product innovativeness on applicant attraction operates entirely through perceived product innovativeness.

To examine the moderating role of displayed affective passion in the relationship between communicated product innovativeness and perceived product innovativeness, an interaction term (Displayed_Passion × Communicated_Prod_Inno) was included in the model. Contrary to the hypothesized positive moderating effect, the results reveal a significant negative interaction effect (b = -0.18,

p = 0.000). This suggests that high levels of displayed affective passion weaken the relationship between communicated product innovativeness and perceived product innovativeness. A graphical representation of the interaction effect demonstrates that when displayed affective passion is low, there is a strong positive association between communicated and perceived product innovativeness. However, when the displayed affective passion is high, this relationship disappears. These findings do not support Hypothesis 2.

Predictor	Model 1 (DV: Perceived_Prod_Inno)	Model 2 (DV: Attraction)	Model 3 (DV: Attraction)
a0 Constant	0.912 (1.456)	−0.834 (2.107)	−2.112 (3.487)
a1 Displayed_Passion	0.158 (0.035) ***	0.812 (0.180) ***	0.573 (0.149) ***
a2 Displayed_Passion × Displayed_Passion	-	-	−0.103 (0.028) ***
a3 Communicated_Prod_Inno	0.327 (0.044) ***	0.781 (0.148) ***	0.091 (0.053) †
a4 Displayed_Passion × Communicated_Prod_Inno	-	−0.195 (0.037) ***	-
a5 Perceived_Prod_Inno	-	-	0.407 (0.039) ***
a6 Participant_Gender	0.521 (0.102) ***	0.458 (0.091) ***	0.309 (0.128) *
a7 Participant_Age	0.067 (0.051)	0.073 (0.049)	0.188 (0.098) †
a8 New_Ventures_Appeal	0.061 (0.027) *	0.042 (0.025) †	0.078 (0.041) †
a9 Student_Avg_Mark	−0.011 (0.023)	−0.014 (0.021)	−0.142 (0.046) **
a10 Entrepreneur_Age	0.018 (0.007) **	0.014 (0.006) *	0.039 (0.008) ***
a11 Entrepreneur_Attractiveness	−0.095 (0.029) **	−0.110 (0.030) ***	0.042 (0.025)
a12 Video_Length	−0.001 (0.001)	−0.003 (0.001) *	−0.007 (0.003) **
a13 Venture_Familiarity	−0.301 (0.120) *	−0.347 (0.142) *	0.439 (0.127) ***
a14 Problem_Familiarity	0.078 (0.026) **	0.071 (0.023) **	0.217 (0.030) ***
a15 Industry_Attractiveness	0.103 (0.021) ***	0.095 (0.024) ***	0.191 (0.025) ***
Number of observations	909	909	909
χ^2 test: a1 = a2 = 0	-	-	19.72 (2) ***

Table 5 Results of GSEM estimates

The study also investigates the direct relationship between displayed affective passion and applicant attraction. A curvilinear relationship was tested by including both displayed affective passion and its squared term in the model. The results indicate that displayed affective passion has an inverted U-shaped effect on applicant attraction, as the coefficient for displayed affective passion is positive (b = 0.68, p = 0.000), while the coefficient for its squared term is negative (b = -0.09, p = 0.000). This suggests that applicant attraction initially increases as displayed affective passion rises, but beyond a certain point, excessive passion reduces attraction. The graphical representation confirms that moderate levels of displayed affective female participants, older individuals, and those with lower academic performance are more likely to be attracted to the sample ventures.passion maximize applicant attraction, while extreme levels of passion discourage potential applicants. These findings support Hypothesis 3. The results also provide insights into additional relationships. Displayed affective passion positively influences perceived product innovativeness, as indicated by a significant positive coefficient (b = 0.13, p = 0.000). This suggests that entrepreneurs who

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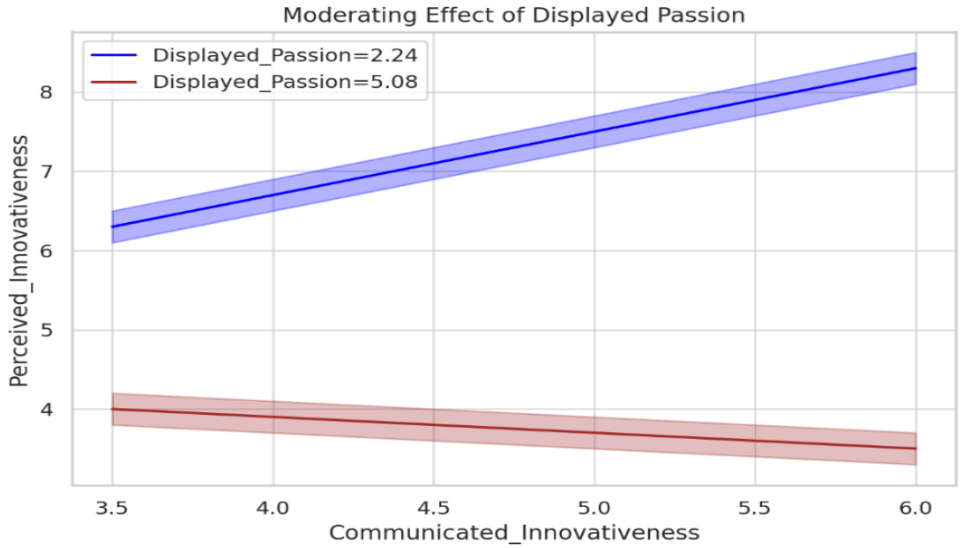
display higher affective passion when presenting their products or services are perceived as offering more innovative products. Regarding individual characteristics, female participants and those with a stronger inclination to work in new ventures perceive products as more innovative. Similarly, product innovativeness and applicant attraction. Industry attractiveness and familiarity with the problem addressed by the venture positively impact both variables. However, prior familiarity with a venture negatively influences perceived product innovativeness, suggesting that individuals who already know a venture may not view its products as highly innovative. Conversely, organizational familiarity positively influences applicant attraction, aligning with prior research on recruitment. Among venture-related characteristics, entrepreneur age positively influences both perceived product innovativeness and applicant attraction. In contrast, entrepreneur physical attractiveness negatively affects perceived product innovativeness but has no significant effect on applicant attraction. Video length negatively impacts applicant attraction, indicating that shorter videos may be more effective in engaging job seekers.Finally, several industry-related factors influence perceived

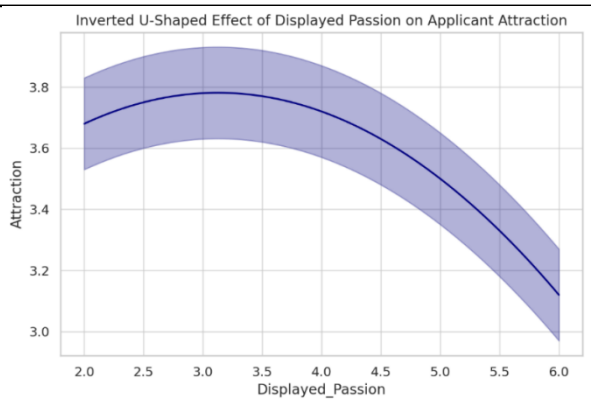
Fig. 3 The moderating efect of displayed afective passion on the relation between communicated product innovativeness and perceived product innovativeness



5 Discussion and conclusions

This study explores how entrepreneurs can effectively communicate the unique attributes of their ventures to attract job seekers. Specifically, it examines how verbal expressions, such as communicated product innovativeness, and nonverbal expressions, such as displayed affective passion, influence applicant attraction both individually and in combination.

Fig. 4 Inverted U-shaped efect of displayed afective passion on applicant attraction



This study explores how startups can strategically communicate their innovative edge to attract top talent in an increasingly competitive labor market. Specifically, it investigates how verbal elements, such as communicated product innovativeness, and written expressions of affective passion, influence applicant attraction—both independently and in combination—within text-based recruitment materials.

The findings confirm that when startups clearly articulate the innovative features of their products or services in written recruitment documents, job seekers are more likely to perceive the venture as innovative, which in turn increases their attraction to the startup. However, the influence of affective passion—conveyed through enthusiastic and expressive language—follows an inverted U-shaped pattern: moderate levels of passion enhance applicant attraction, but excessive levels may have the opposite effect. Overly intense passion in text may be interpreted as rigid, obsessive, or lacking professionalism, possibly raising concerns about the venture's long-term stability or decision-making.

Interestingly, the study does not find a combined reinforcing effect between communicated innovativeness and written passion. Instead, the results show that communicated product innovativeness boosts perceived innovativeness only when the affective passion expressed in text is low to moderate. When affective passion is high, applicants rely more on the emotional tone of the message than on the specific innovative content. This outcome aligns with information processing theory, suggesting that job seekers, particularly those unfamiliar with technical details, tend to focus on more accessible cues—like expressive language—rather than on more complex informational content.

By emphasizing how startups use written communication to signal innovation and passion, this study expands current recruitment research beyond employer branding and static venture characteristics. It highlights the importance of message design and tone in startup recruitment efforts and contributes to a deeper understanding of how entrepreneurial passion, even in written form, can influence applicant behavior—both positively and negatively.

While this study offers valuable insights, it also presents several limitations that open paths for future research. It does not account for how job seeker characteristics—such as gender, cognitive preferences, emotional intelligence, or cultural norms—might affect responses to recruitment communication. The study also focuses exclusively on early-stage recruitment outcomes (like initial attraction), leaving unexplored how communication affects later stages such as job offer acceptance or employee retention. Additionally, only affective passion expressed in writing was analyzed, omitting cognitive or behavioral expressions of passion, as well as different types of entrepreneurial passion (e.g., for founding, developing, or inventing). Finally, since the sample consisted of final-year business students in Pakistan, further research is needed to determine whether these findings generalize to other applicant populations, such as mid-career professionals or individuals from different regions or industries.

For startups looking to win the war for talent, the study offers practical takeaways. Clear written communication of product innovation is

a powerful attractor—especially for ventures offering truly novel solutions. When innovation is less obvious, authentic and moderately passionate language in recruitment documents can still engage applicants and generate interest. However, founders should be cautious not to overstate their enthusiasm, as this may alienate potential hires. Given that many startups are team-based, with members differing in communication styles, these findings can help startups determine who should represent the venture in written outreach to prospective employees, such as job descriptions, LinkedIn posts, or talent-facing websites.

Appendix

For startups striving to win the war for talent, this study provides valuable insights into how strategically crafted recruitment communication can influence applicant perceptions. When a startup's products or services are perceived as innovative, founders can improve their talent appeal by clearly articulating product innovativeness within their written recruitment materials. In cases where product innovativeness is less pronounced, infusing written messages with affective passion—through enthusiastic, expressive language—can help enhance applicant attraction. However, overly intense expressions of passion in text may come across as exaggerated or inauthentic, potentially discouraging interest. Given that many startups are built by founding teams rather than solo entrepreneurs, and team members may vary in their communication styles, these findings can guide startups in selecting the most compelling voices to represent them in text-based outreach to potential hires.

The study targeted final-year BBA students at a business school in Pakistan. Participants were invited to take part in an online survey and were assured that their responses would remain confidential and be used for research purposes only. The survey was conducted in a controlled setting to ensure participants completed it independently, reducing the risk of discussion or external influence.

To simulate a realistic job search scenario, participants were instructed to imagine they were evaluating job opportunities and deciding whether they would apply to the ventures described. Each participant was presented with written descriptions of startups, ensuring that all ventures were depicted as having existing customers, consistent revenue growth, investor interest or funding discussions, open job positions aligned with participants' functional areas of interest, and competitive salaries in locations where participants preferred to work.

To control for variations in perception, descriptions were crafted in a standardized manner, maintaining a similar length, structure, and level of detail across all conditions. Participants were randomly assigned different versions of the descriptions, each varying in the level of communicated product innovativeness. Since nonverbal cues such as passion could not be observed directly, the survey incorporated textual elements to subtly convey enthusiasm or neutrality in how ventures were described.

The survey was conducted in [Month, Year]. Participants completed it independently, ensuring no interaction that could bias responses. No incentives were provided for participation. After reading the venture descriptions, participants answered structured questions measuring their perceived product innovativeness and attraction to the venture. This adaptation ensures that the study retains its focus on applicant attraction while accounting for the absence of video-based nonverbal cues.

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