

# The Impact of Presentation Form, Entrepreneurial Passion, and Perceived Preparedness on Obtaining Grant Funding

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## Abstract

This study investigates important questions for any emerging high-technology firm attempting to obtain funding: Does the design of the presentation and the perceived passion and preparedness of the presenter influence expert reviewers' assessment of the merits of the firm's proposal? The authors analyzed 22 videotaped presentations to reviewer panels at a U.S. Department of Defense technology transfer consortium and compared

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the panels' assessments of the presenting firms' proposals both before and after the formal presentations. The data showed that, on average, higher levels of perceived entrepreneurial passion and presenter preparedness and presentation designs that effectively captured the audiences' attention resulted in higher ratings by decision makers on the firm's technology merit, management ability, and commercial potential.

**Keywords**

entrepreneurial passion, presentation design, high technology, early-stage funding, grant proposals

Technology development is expensive and early-stage technology firms need access to funding from a variety of different sources. Wong (2002) found that 69% of private equity funds from angel groups go to high-technology firms in prerevenue phases of development, and research by the Kaufman Foundation (2009) indicated that the majority of high technology start-ups need an average of \$140,000 of external capital in their first year of operation with additional infusions of capital in following years. It is not surprising that financing problems are consistently cited by early-stage firms as a major area of stress (Bruno & Tybee, 1985; Graves, 2011; Gundry & Welsch, 2001; Sapienza & De Clercq, 2000; Shane & Stuart, 2002). Obtaining early-stage funding, particularly in high-technology sectors, is highly competitive and inevitably requires presenting business and technological arguments to various funding entities, such as private equity investors, government grant agencies, banking institutions, or potential corporate partners, in the most persuasive manner possible.

These funding entities oftentimes use a sequential process of decision making. The process typically begins with a fairly quick screening, or "down-select" process, in which a number of written business plans, proposals, or applications are formally reviewed and sorted (e.g., Ajamian & Koen, 2002; Galbraith, De Noble, Ehrlich, & Kline, 2007; Linton, Walsh, & Morabito, 2002; Ozer, 1999; Shepard, Zacharakis, & Baron, 2003). Although this initial screening process provides useful information (Galbraith, De Noble, & Ehrlich, 2009, 2012; Payne & Macarty, 2002), funders often require another screening phase in which a select group of the original applicants are allowed to personally present to a panel of decision makers who then vote on the merits of the proposal. This presentation phase provides the reviewers with not only much more detailed data about the applicant's technology and

business strategy but also a chance to personally see the entrepreneur in action. While a few studies have provided general descriptions of this presentation phase (e.g., Payne & Macarty, 2002; Sudek, 2007), few, if any, research studies have empirically measured the perceptual changes that occur during these funding presentations.

Incorporating panel presentations into the funding process stems from a key premise that groups will generally make better decisions than individuals will because of the superior informational resources that arise from the nuances of an oral presentation and the opportunity to exchange information between panel members (Bunderson & Sutcliffe, 2002; Jehn & Shah, 1997; Priem, Harrison, & Muir, 1995; Rothstein & Jackson, 1980; Stasser, 1992; Stasser & Titus, 1985; Steiner, 1982). Panel members must analyze and interpret the different informational cues that are being presented and consider how these cues may predict future commercial success. For early-stage technology firms, questions often arise as to which factors, such as market readiness, technology readiness, commercial readiness, or management readiness, are the best success predictors (Heslop, McGregor, & Griffith, 2001). Because cues and information can be interpreted differently, granting agencies, private equity investor groups, and other funding organizations tend to construct reviewer panels made up of experts with diverse backgrounds.

## **Persuasive Speech and Entrepreneurial Funding**

In the following subsections, we provide a background for our study. In particular, we examine several issues that may affect the entrepreneurial funding process, such as the relationship between persuasive speech and credibility, the impact of entrepreneurial passion and presenter preparation on the ability to obtain funding, and how certain design elements of the formal presentation may affect the perceptions that reviewers have about the entrepreneur.

### ***Persuasive Speech and Credibility***

Historically, the ability to persuade an audience is often associated with the concept of “delivery” (Cicero, 1960; Kennedy, 1991; Newman, 2001; Sproule, 2012). For example, five canons of rhetoric are identified in Aristotle’s *Rhetoric*: invention (the ability to locate the best evidence), arrangement (the organization of the speech), style (the ability to use the best language), memory (having a firm grasp of the material of the

speech), and delivery (the performance of the speaker). When asked which canon was the most important aspect in public speaking, the great Greek orator Demosthenes responded that delivery was first, second, and third (Brooks, 1971, p. 161). In their investigation of the relationship between speech delivery and speech effectiveness, Gunderson and Hopper (1976) concluded that the effectiveness of presentations depended on their composition and delivery. They identified six effective delivery behaviors that have been cited by authors of the most popular public speaking texts: vocal volume, rate of speech, voice quality, posture, gesture, and body movement. In other words, while content and organization are both important, a poorly delivered message will usually negatively affect the persuasiveness of the speaker (e.g., Arnold, 2007; Osborn & Osborn, 2012). As Caputo and Yount (1993) noted, for speakers to be persuasive they must speak from the heart, and their speech should be accompanied with the “corresponding looks, and gestures, which naturally result from a man speaking in earnest” (p. 4).

Recent empirical studies have suggested that the perceived credibility of an entrepreneur is a key to obtaining funding (e.g., Chen, Yao, & Kotha, 2009; Galbraith et al., 2009; Sudek, 2007, 2009). This argument actually has a long historical context. With respect to Aristotle’s three persuasive arguments—logos (logic), pathos (emotion), and ethos (credibility)—ethos, or credibility, is most associated with delivery. For speakers to appear persuasive, they must also appear credible; to appear credible, they must have an effective delivery. And as Pornpitakpan (2004) noted, high source credibility has a direct effect on behavioral compliance. This is a common theme in both scholarly research and modern communication textbooks (e.g., Beebe & Beebe, 2012; Dillard, Weber, & Vail, 2007; O’Keefe, 2002; Tindale, 2011; Winterbottom, Bekker, Conner, & Mooney, 2008).

Speaker credibility has also been related to the notion of a “powerful voice.” Erickson, Lind, Johnson, and O’Barr (1978) concluded that a delivery exhibiting a “powerful” speech style is more credible and therefore more persuasive than a delivery with a powerless style. Likewise, Bradac and Street (1990) viewed a powerful speech style as a global construct that is evaluated positively because we perceive the people using it as powerful, and in turn, powerful people are capable of controlling the behavior of others. Bradac, Hemphill, and Tardy (1981) found that speakers who had a powerful speech delivery were seen as more competent in their speaking ability whereas Wright and Hosman (1983) and Hosman and Wright (1987) discovered that if a speaker frequently used hedges and hesitations, they were perceived to be less credible, less authoritative, and less

attractive. And Hosman and Siltanen (1994) concluded that powerful speakers are perceived to have both more self-control and the ability to exert more control over others (see also Hosman, Huebner, & Siltanen, 2002; Hosman & Siltanen, 2006).

In an extensive analysis on the nonverbal aspects of delivery, Burgoon, Birk, and Pfau (1990) posited that nonverbal behaviors that are most associated with delivery are kinesic–proxemic cues and vocal cues. In their analysis, they identified five key nonverbal behaviors that had significant correlations with the persuasiveness of a message: competence, sociability, character, composure, and dynamism. They concluded that “it may be reasonable to assume . . . that credibility and persuasiveness are simultaneous outcomes both of which are directly influenced by nonverbal variables” (p. 164). In other words, the nonverbal aspect of a presentation is also significantly related to credibility and thus persuasion. This impact that nonverbal aspects of speech have on persuasion has been subsequently examined in a variety of contexts (e.g., Mason, Tatkov, & Macrae, 2005; Smith & Shaffer, 1995; Yokoyama & Daibo, 2012).

### *Presentation and Entrepreneurial Passion*

The importance of entrepreneurial passion has been recognized in business literature for several decades (Baum & Locke, 2004; Baum, Locke, & Smith, 2001; Bird, 1989; Cardon, Wincent, & Singh, 2009; Cardon, Zietsman, Saporito, Matherne, & Davis, 2005; Carland, Hoy, Boulton, & Carland, 1984; Shane, Locke, & Collins, 2003). Entrepreneurial passion has often been referred to as the “fire in the belly” that emerges when “one has the freedom and opportunity to pursue one’s dream” (Smilor, 1997, p. 342). Timmons (2000) noted that it is this fire in the belly that allows entrepreneurs to deal with the uncertainty associated with running a fledging business. Cardon, Wincent, and Singh (2009) identified three basic aspects of entrepreneurial passion: It is intense, it is motivating, and it is targeted toward a venture-related opportunity. Some researchers have classified passion within a work environment as being either “harmonious” or “obsessive” (e.g., Amiot, Vaqllerand, & Blanchard, 2006; Vallerand et al., 2003). Obsessive passion comes from job pressures and the need to achieve an outcome whereas harmonious passion is a self-motivating emotion that stems from the voluntary internalization of work. Entrepreneurial passion is most directly related to the notion of harmonious passion, and this type of passion has often been associated with entrepreneurial success (Foo, Uy, & Baron, 2009).

Researchers have also noted the importance of the “communicated vision” within an entrepreneurial setting (Baum & Locke, 2004; Baum, Locke, & Kirkpatrick, 1998; Tichy & Devanna, 1986). Communicated vision refers to both the content of what is communicated and how the communication takes place, such as with pep talks or formal presentations (Tichy & Devanna, 1986). Cardon (2008), in fact, argued that entrepreneurial passion can be directly transferred both to the internal organization and to the external stakeholders by these different modes of communication. Baum and Locke (2004) even suggested that the entrepreneur’s communicated vision may be as important for motivating high venture performance as the vision itself.

The importance of entrepreneurial personality and communicated vision is starting to be examined within the specific context of funding opportunities. Sudek (2007, 2009) found that the perception of entrepreneurs’ “trustworthiness” significantly influenced investors’ interest during formal presentations to a private equity group. Using a series of laboratory experiments and a field study of presentations during a business plan competition, Chen, Yao, and Kotha (2009) discovered that a panel’s perception of an entrepreneur’s preparedness significantly influenced the scoring of business plans during the formal presentation whereas entrepreneurial passion did not significantly influence the panel’s scoring. One possible explanation for this finding is that the raters in Chen et al.’s study were participating in a student business plan competition and not making real funding decisions. For example, Sudek, Mitteness, and Cardon (2010) examined actual videotaped presentations to a large private equity group and found that, indeed, the investors’ perception of entrepreneurial passion (using Chen et al.’s “passion and preparedness” scale) was significantly correlated with their ratings of the investment opportunity. Sudek’s (2007, 2009), Chen et al.’s (2009), and Sudek et al.’s (2010) studies used only a postpresentation research design, however. Using just a postpresentation research design rather than both a prepresentation and a postpresentation research design makes it difficult to separate the impact that the presentation had on the panel’s overall rating from that of the content of the business plan since many panel members probably had not read the business plans prior to the formal presentation.

Finally, some examinations of presentations, particularly those using PowerPoint, have shown that audiences get “distracted” by the overuse of visual material (e.g., Goldstein, 2003). Dannels (2003) suggested that technical audiences, such as scientists and engineers, are particularly negatively disposed to “showboating” components of a technical presentation, focusing instead on the content aspects.

## The Technical Aspects of Presentations

With advances in presentation software, there is increasing evidence suggesting that the design and sequencing of a technical presentation will significantly influence the audience's perception of the underlying project's potential (e.g., Alley & Neeley, 2005; Caricato, 2000; Dannels, 2003; Farkas, 2005). The underlying argument is that audiences will interpret the different cues based to some degree on its technical aspects, as well as on the presenter's personality and the actual content of the presentation. According to Rude (2009), this argument raises an important question as to "how texts (print, digital, multimedia, visual, verbal) and related communication practices mediate knowledge, values, and action" (p. 176). One approach to examining this broad issue of presentation technology is to focus on the process of encoding or decoding imbedded messages (e.g., Hall, 1980; Terranova, 2004). Other scholars have examined the theoretical problem of how audiences separate presentation design from presentation content (e.g., Clark, 2008).

A technical presentation by its very nature often needs to communicate a combination of scientific, engineering, and other highly detailed data. How a presentation starts has received particular attention. Andeweg, de Jong, and Hoeken (1998) argued that a well-designed introductory component within a technical presentation makes audiences more willing to listen to the later, more detailed information. Osborn and Osborn (2012) described three functions of the introduction: capturing attention, establishing credibility, and previewing the topic. Verderber (1994), on the other hand, discussed four functions: getting attention, setting the tone, creating goodwill (similar to credibility), and leading into content. Several researchers (e.g., Andeweg, de Jong, & Hoeken, 1998; Gerritsen & Wannet, 2005; McCroskey, 2001) have suggested examining presentations, particularly with respect to introductions, using the triad developed by the Sophists and Cicero (see Andeweg et al., 1998, p. 272; Gerritsen & Wannet, 2005, p. 195; Van De Mieroop, de Jong, & Andeweg, 2008)—that is, gaining attention and establishing the willingness of the audience for the subject (*attentum facere*), increasing the ability to listen and giving information (*docile facere*), and establishing the speaker's creditability (*benevolum facere*).

## Our Research Questions

The majority of funding for early-stage high-technology enterprises generally comes from a combination of two sources: private equity investors and government-sponsored research grants. Regardless of their source of

funding, entrepreneurs seeking capital must focus on those persuasive factors in their presentation that will capture the audience's interest and influence their decision to fund the project.

Such factors have only started to be empirically examined within the context of private equity investors (Chen et al., 2009; Sudek, 2007, 2009; Sudek, Mitteness, & Cardon, 2010). Few, if any, empirical studies have examined this question within the context of grant funding, however. Our study of entrepreneurs' presentations to a consortium sponsored by the U.S. Department of Defense adds to this emerging literature by examining the following research questions:

1. Does presenter behavior, such as the perceived passion of the entrepreneur, influence the review panel's assessment of the merits of the proposal?
2. Does the presentation form and style influence the review panel's assessment of the merits of the proposal?
3. Does the impact of presentation form and presenter behavior differ depending on the panel reviewers' vocational backgrounds?

## **Method**

Our study examined a sample of proposals that were presented to a granting and technology commercialization agency sponsored by the U.S. Department of Defense. This particular agency has a specific mission of funding homeland security, medical, and other first responder technologies that have been developed by small businesses and government research laboratories with high commercialization potential.

The agency publishes a call for proposals two or three times per year. After receiving the applications, the agency starts a typical two-phased screening process. In the first phase, the detailed written applications are reviewed and scored, eliminating about 85% of the original applications. Since the primary mission of this particular agency is commercializing new technologies, the application is modeled after the detailed business plan summaries often presented to private equity investor groups. Each application is approximately 12–15 pages in length and includes specific sections on the target market, the technology's advantages, strategies for commercialization, previous funding, the nature of the competition, and the backgrounds of the management and scientific team.

In the second phase, the remaining applicants are invited to formally present their business plan proposals to a panel of experts organized by the granting agency. The applicants each make a formal 20- to 30-minute



presentation to a panel consisting of four to seven members (called panel reviewers here), which is then followed by a final scoring process. For this agency, the different panels were formed based on the nature of the technology (e.g., biotechnology, instrumentation, or software), so generally the same panel reviewers were assigned to all the presentations within their respective technology class. All the panel reviewers held graduate degrees. By design, each panel contained reviewers from different vocations, such as scientists or engineers, consultants, entrepreneurs, government technical program administrators, and private equity investors. Regardless of their current vocation, however, each panel reviewer had significant experience in the type of technology to which they were assigned. The particular agency funds approximately 65% of the applicants who make it to this second, presentation phase.

Our study examined 22 different technology presentations during two different funding cycles within a 1-year period. The technologies presented were considered to be highly advanced middle-stage solutions, generally with a technology readiness level classification of five to seven. The presenters were seeking funding that was specifically targeted to advancing the technology to the next phase of commercial development. All but one of the presentations analyzed in this study were from small businesses with fewer than 25 employees; the other was from a government laboratory. In all cases, the technology presented was the primary technology or product being developed by the business. The senior executive for each enterprise (called entrepreneur presenters in this study) was the formal presenter before the review panel.

### *Variables for the Panel Reviewer Assessments*

Prior to the formal presentation, each of the panel reviewers read every application in their assigned technology group and then formally scored them on a number of dimensions. This prepresentation review was based solely on the detailed business plan summary in the application. If a panel reviewer had not thoroughly read the proposal beforehand, they were asked to not respond to the prepresentation assessment. Less than 5% of the panel reviewers did not fill out the prepresentation assessment, and these reviewers were excluded from our analysis. After the presentation, the panel reviewers again individually evaluated the proposal using the same scoring instrument—thus, we had a prepresentation and postpresentation metric by reviewer for each technology along the same assessment dimensions.

Panel reviewers scored the project on eight different assessment variables that generally corresponded to the key dimensions used by Heslop, McGregor, and Griffith (2001); Astebro (2004); and Galbraith, De Noble, and Ehrlich (2009). The panel reviewers used an 11-point Likert-type scale to score each variable. Within the group decision-making literature, the panel reviewers' decisions would therefore be considered "non-discrete" quantitative judgments similar to those examined within the social judgment scheme model (Davis, 1996; Ohtsubo, Masuchi, & Nakanishi, 2002).

Although the 8-item total score was the most important factor influencing the final funding decision, the assessment form included a couple questions directly related to the applicability of the proposal to the granting agency's requirements and not specifically related to the merits of the technology or business. Therefore, for this study, we also examined three of the variables that the reviewers scored that were more business and technology oriented: the panel's assessment of the "technical merit," "commercial potential," and "ability of the management/project team to execute plan."

### *Variables for the Assessments of the Videotaped Presentations*

We videotaped each of the presentations. These videos were then separately examined by two independent evaluators who rated the various aspects of the presentation. Both evaluators were pretrained on using the specific questionnaire that they used for assessing the videos. So that the video evaluators would focus on the behavior of the presenters and not be influenced by the technical content of the presentation, we chose evaluators who were advanced industrial psychology majors who had no formal engineering or scientific training.

For the video analysis, the entrepreneur presenters' "passion" and "preparedness" were measured using the 11-item scale developed by Chen et al. (2009). In our sample, the calculated Cronbach's  $\alpha$  reliability for the 6-item passion subscale was .96, and the calculated Cronbach's  $\alpha$  reliability for the 5-item preparedness subscale was .79, scores very similar to those reported by Chen et al. Following Caricato (2000) and Sudek (2007, 2009), we measured the perception of entrepreneur presenter's ethical and trustworthiness behaviors by 2 items, "the presenter appeared trustworthy" and the "presenter appeared ethical." Perceptions of the introduction consisted of 6 items that we modified from the Gerritsen and Wannet's (2005) scale: The introduction "was boring," "made me curious about the rest of the presentation," "gave a good impression of expertise of team/firm," "was

convincing,” “lacked structure,” and “was difficult to follow.” In addition, we measured what is often called “visual style” (King, 2008). Our questionnaire included 2 items about the visual style of the presentation: whether the presentation was “attractive” (see King, 2008, for a discussion of the “aesthetic” in technical presentations) and whether the presentation used a lot of “visuals” (e.g., examples, displays, and props). The videotape evaluators measured all the items on a 5-point Likert-type scale.

We measured the interrater agreement by the intraclass correlation coefficient (ICC), using the two-way mixed model for the various subscales and items in our questionnaire. The ICC was .78 for the 6-item presenter-passion construct, .64 for the 5-item presenter-preparedness construct, .53 for the presenter-trustworthiness question, .73 for the presenter appearing ethical question, .72 for the 2-item visual-style construct, and .64 for the 6-item presentation-introduction questions. All of these subscale interclass correlations were statistically significant ( $p < .05$ ) and indicated moderate to strong agreement between the two video evaluators.

## **Examples of Presentation Behaviors: High Versus Low Passion**

Since the perception of entrepreneurial passion is one of the key issues in the entrepreneurial funding literature, we wanted to examine whether or not there are certain objective behavioral measures of the presentation that might be related to the video reviewers’ perception of entrepreneurial passion. We therefore compared the two presentations that the video evaluators ranked the lowest (2.16 and 2.33) on Chen et al.’s (2009) passion scale with the two presentations that they ranked the highest (4.33 and 4.50) on the passion scale.

We used nine different objective measures in this comparison, six of which were adapted from a study by Burgoon et al. (1990), who classified a number of different “nonverbal” behaviors related to speaker credibility and persuasion. From their “vocalic” category, we selected pitch, pitch variety, and tempo. Although in-depth studies of speaker’s pitch and pitch variety usually employ sophisticated software for frequency smoothing that measures a speaker’s pitch as a fundamental frequency based on sound frequency, or hertz (Hz), and pitch variety as a standard deviation around the fundamental frequency (e.g., Hincks & Edlund, 2009; Ladd & Morton, 1997; Shriberg, Ladd, Terken, & Stolke, 1996), we estimated these variables using a handheld hertz-based tuning meter. Using two 30-second segments, we estimated the speaker’s average pitch and the variation above the

average pitch in terms of hertz. Using the same two 30-second segments, we also performed a word count to determine tempo. From Burgoon et al.'s "kinesics–proxemics" classification, we selected hand gestures (distinct hand movements above the waist), presenter movement, and distance orientation (from the audience and the front screen), measuring these factors using a 10-minute segment during the middle of each presentation.

In addition, the appropriate structure of PowerPoint slides for technical presentations, including the importance of images and slide duration, has received increased attention within the communication literature although empirical research in this area still remains somewhat rare (Alley & Neeley, 2005; Farkas, 2006; Thielsch & Perabo, 2012). We therefore also measured whether or not a demonstration was made of the technology (e.g., the technology was shown in a video embedded in the slides or handed out to the review panel), the percentage of slides that had graphics (charts, pictures, graphs), and the average time duration for an individual slide (see Table 1).

In this small sample, it appears that the entrepreneur presenters who were more highly rated on entrepreneurial passion differed in several of their presentation behaviors and formats from those who were less highly rated on the passion scale. In particular, we saw differences on all three kinesics–proxemics metrics—that is, entrepreneur presenters who were rated higher on entrepreneurial passion had more body movements and hand gestures and stood closer to the review panel. In addition, presenters who had greater pitch variety, more graphics in the presentation, and shorter slide durations were also perceived as having higher entrepreneurial passion. This finding suggests that slide graphics and duration may not only affect an audience's attention and retention, as Alley and Neeley (2005) argued, but they may also affect an audience's perception of the presenter passion and intended meaning (see Farkas, 2009).

## **Analysis: Impact of the Presentation on the Panel's Assessment and Scoring**

The primary focus of our study is on whether the entrepreneur's presentation was related to the panel reviewers' postpresentation evaluation of the merits of the firm and technology and thus the likelihood of obtaining funding. We first examined the full 8-item score. The changes between the pre-presentation and postpresentation scoring indicated high variation between the 22 individual technology presentations. For example, the largest positive numerical change by the panel reviewers for a particular presentation was 8.83 (postpresentation 8-item score minus the prepresentation 8-item

**Table 1.** Examples of the Differences in Presentation Behaviors: High Versus Low Entrepreneurial Passion.

Presentation Behaviors	Low Scores on Passion		High Scores on Passion	
	Example 1_(Optical Hardware)	Example 2_(Video Mapping)	Example 3 (Water Test Kit)	Example 4 (Vaccine Adjuvant)
Movement and distance orientation (10-minute sample period)	Never moved from 3 foot radius near computer, 6 feet to side of front screen	For whole presentation stood behind podium, 6 feet to side of front screen	Moved around the front, stood close to audience and 2 feet to side of front screen	Moved around front, stood between 2 feet from screen and 1 foot in front of screen
Hand gestures (10-minute sample period)	Less than 5 distinct hand gestures per min	Less than 1 distinct hand gesture per min	Greater than 10 distinct hand gestures per min	Hand gestures above waist 95% of time
Vocal pitch and variety (two random 30-second periods)	Male presenter(130 Hz pitch average)—low variation, generally less than 30 Hz variation	Female presenter (180 Hz pitch average)—low variation, less than 30 Hz variation	Male presenter (125 Hz pitch average)—wide variation, greater than 30 Hz variation	Female presenter (170 Hz pitch average)—wide variation, greater than 30 Hz variation
Speed of vocalization (two random 30-second periods)	Fast (>140 words/min)	Medium (120–140 words/min)	Fast (>140 words/min)	Medium (120–140 words/min)
Technology demonstration	Yes, 1 example	No	Yes, 2 examples	No
Slide graphics (pictures, charts, and graphs)	Small print, less than 25% slides with graphics	Small print, less than 25% slides with graphics	Larger print, greater than 75% slides with graphics	Large print, 50% of slides with graphics
Slide duration	Greater than 2 minutes per slide	1 to 2 minutes per slide	Less than 1 minute per slide	Less than 1 minute per slide

Note. Average vocal pitch determined from meter placed 3 inches from video speaker; pitch variation category was judged by one of the authors. Pitch variation measurement by the meter was difficult and can only be considered a rough estimate.

score) whereas the largest negative numerical change for a presentation was  $-6.25$ . Because all of the panel reviewers had read and scored the detailed application prior to the presentation, this variation indicates that the entrepreneurs' formal presentation before the review panel helped some firms' chances to obtain funding but hurt other firms' chances.

There was also similar variation in the differences between the prepresentation and postpresentation scores for the panel reviewers' assessment of the specific dimensions of technical merit, commercial potential, and management ability. In about a third of the sample, the change in panel reviewers' assessment of technical merit from before the presentation to after the presentation moved in the opposite direction from the change in panel reviewers' assessment of both commercial potential and management ability.

### Three Presentation Factors

We analyzed the scoring of the two independent evaluators of the presentation videos. Our preliminary factor analysis indicated that one of Chen et al.'s (2009) items for measuring preparedness ("the presenter articulated the relationship between the proposal and broader context") was not highly correlated with the other preparedness items. Instead, this item was more directly associated with some of the questions that we adapted from Gerritsen and Wannet's (2005) study. We therefore used only the 4 remaining preparedness items in our perceived entrepreneurial-presenter preparedness scale. Since all six of Chen et al.'s questions for measuring passion loaded on the same factor, we used the full 6-item entrepreneurial passion scale. We then performed a final factor analysis using the 6 items we adapted from Gerritsen and Wannet's study, the single item "the presenter articulated the relationship between the proposal and broader context," and the 2 items "the presenter appeared trustworthy" and "presenter appeared ethical."

From this second factor analysis, we extracted three factors (eigenvalues  $> 1.0$ ) that accounted for about 77.1% of the total variation. The first factor combined the items "introduction was boring" (negative loading), "introduction made me curious about the rest of the presentation," "introduction was convincing," and "the presenter articulated the relationship between the proposal and broader context." This factor corresponds to the concept of *attentum facere* or gaining attention (labeled *attention* for our analysis). The second factor combined the items "introduction lacked structure" and "introduction was difficult to follow." This factor generally corresponds to the idea of *docile facere* (negatively coded) or

increasing the ability to listen and preparing the listeners for content (labeled *difficulty* for our analysis). The final factor combined the 2 items “the presenter appeared trustworthy” and “presenter appeared ethical.” This factor (labeled *credibility* for our analysis) corresponds to the concept of *benevolent facere*, or establishing the speaker’s creditability (Andeweg et al., 1998; Gerritsen & Wannet, 2005; McCroskey, 2001). Our calculations for the Cronbach’s  $\alpha$  (using the items that loaded on the different factors) in our sample were .80 for *attention*, .76 for *difficulty*, and .82 for *credibility*, similar to those reported in Gerritsen and Wannet (2005, p. 199).

### ***The Effect of Presentation and Entrepreneurial Passion on Reviewers’ Assessment***

To analyze how a presentation influenced the panel reviewers’ assessment of the merits of the applicant firm’s technology and business model, we used a *t*-test for mean differences. The seven presentation variables, as scored by the two independent video evaluators, were (a) the perceived entrepreneurial passion score (using the 6-item passion scale from Chen et al., 2009), (b) the perceived entrepreneurial preparedness score (using 4-items from the 5-item preparedness scale from Chen et al., 2009), (c) the attention factor score, (d) the difficulty factor score, (e) the credibility factor score, (f) the single-item question about presentation attractiveness, and (g) the single-item question about use of visuals in the presentation. For each of these presentation variables, we separated the sample into categories of high versus low, using the mean value of that particular presentation variable as the dividing point. We then performed a *t*-test for the mean differences of the changes between the panel reviewers’ prepresentation and postpresentation scores for technology merit, commercial potential, and management ability and for the mean difference in the change in the total evaluation score for the 8-item assessment (see Table 2).

We found statistically significant differences for the presentation variables of perceived entrepreneurial passion, perceived entrepreneurial preparedness, the attention factor score, and presentation attractiveness.<sup>1</sup> Higher scores for perceived entrepreneurial passion, perceived entrepreneurial preparedness, presentation attention, and presentation attractiveness were related to higher postpresentation scores on one or more of the panel-reviewer assessment variables, or in other words, presentation does appear to matter. We found no statistical differences in the presentation difficulty factor score, the presentation credibility factor score, and the use of visuals variable, so these are not reported in the table.

**Table 2.** Mean Differences in the Change Between Prepresentation and Postpresentation for the Panel-Reviewers' Assessment of the Proposal for Presentations With High or Low Passion, High or Low Preparedness, High or Low Attention, and High or Low Presentation Attractiveness.

Dimension assessed by panel reviewers	Passion		Preparedness		Attention		Attractiveness	
	High	Low	High	Low	High	Low	High	Low
Technology merit	0.16	0.01	0.35	-0.24*	0.34	-0.13	0.28	-0.35*
Commercial potential	0.47	-0.42***	0.32	-0.43***	0.29	-0.27**	0.17	-0.42**
Management ability	0.00	0.04	0.25	-0.24	0.33	-0.23**	0.18	-0.32*
Total evaluation	1.71	0.17	2.21	-0.72**	2.12	-0.16*	1.78	-0.21*

Note. Significance for t-test, \* $p < 0.10$ , \*\* $p < 0.05$ , \*\*\* $p < 0.01$ .



The result on perceived entrepreneurial passion is of particular interest to the entrepreneurship literature. We found that presentations with high perceived entrepreneurial passion were associated with a statistically significant increase in the panel reviewers' rating of commercial potential in the postpresentation assessment. According to Chen et al. (2009), the passion scale attempts to measure those components in a presentation that create an "intense affective state accompanied by cognitive and behavioral manifestations of high personal value" (p. 201). And as we found in our study, perceived entrepreneurial passion within a presentation can be expressed through body language, vocal pitch and tone, and gestures. Passion, however, was not significantly related to the panel reviewers' assessment of technology merit. This finding is not surprising because when the panel reviewers assess commercial potential, they are likely to place more weight on their perception of the entrepreneur's ability to market or sell the technology (which requires passion) whereas they are likely to assess technical merit based more on the scientific or engineering content of the presentation than on the passion of the presenting entrepreneur.

We also performed a series of regression analyses to measure the changes between the four prepresentation and postpresentation panel reviewer assessments as the dependent variables. Due to potential multicollinearity issues related to the relatively small sample size and the high significant correlations between the different potential explanatory variables (i.e., passion–attention,  $r = .48$ ; passion–attractiveness,  $r = .46$ ; passion–use of visuals,  $r = .47$ ; preparedness–attention,  $r = .63$ ), for our regression analyses, we use as explanatory variables the three dimensions derived from our factor analysis: attention, difficulty, and credibility (see Table 3).

We found that two of the regression equations were statistically significant, indicating relatively high explanatory power. The technology merit equation resulted in an  $R^2$  of .271 whereas the commercialization potential equation had an  $R^2$  of .399. While the statistical significance of the individual variables was somewhat limited, it appears that the attention factor score, in particular, was positively related to an improvement in the panel reviewers' assessment after the presentation.

### *The Effect of the Panel-Reviewers' Background*

Given the advanced nature of the technologies examined in this study, we were interested in whether or not the vocational background of the panel reviewers had any effect. Lester (1998) suggested, for example, that technical communication provokes an "intellectual response" whereas persuasive

**Table 3.** Regression Analysis for the Mean Differences in the Change Between Prepresentation and Postpresentation for the Panel Reviewers' Assessment of the Proposal.

Variables	Technology Merit	Commercial Potential	Management Ability	Total Assessment
Constant	0.080	-0.020	0.024	0.875
Attention	0.286*	0.471***	0.300**	1.612**
Difficulty	-0.348**	-0.014	-0.145	-0.205
Credibility	-0.211	-0.064	0.056	-0.195
R <sup>2</sup>	.271	.399	.186	.196
F-Stat	3.226**	3.979**	1.368	1.460

Note. Significance for estimated regression coefficients, \* $p < 0.10$ . \*\* $p < .05$ . \*\*\* $p < .01$ .

communication provokes an “emotional response.” Dannels (2003) observed in her research regarding engineering presentations that technically oriented audiences may want to be “talked to like an engineer” and may actually be distracted by the “cute” components of the presentation (pp. 157–160).

Although the vast majority of the panel reviewers had technical backgrounds, because of Dannels's (2003) observation, we performed an additional analysis on the assessments for those panel reviewers who currently worked as managers, consultants, or investors (we labeled these reviewers as *business experienced*) versus those panel reviewers who currently worked in engineering, science, or laboratory jobs (we labeled these reviewers as *technically active*). It is reasonable to expect, for example, that reviewers who have additional business-related experience might view the presentations differently in their assessment of commercial potential and management ability because these reviewers had more personal and professional experience in these areas.

Of the 22 presentations, 17 had panel reviewers who could be classified as technically active. For these 17 technologies, we calculated the change in the four assessment variables between the prepresentation and postpresentation scores for the subsample of technically active panel reviewers and compared these results to the subsample of just business-experienced panel reviewers. Overall, we found few significant differences between the technically active and business-experienced subsamples, with the one significant difference related to the impact of perceived entrepreneurial passion. For the technically active subsample of panel reviewers, high entrepreneurial passion was actually associated with lower average postpresentation

scores on all four assessment variables, with the downward difference in the technical merit score statistically significant ( $p < .10$ ). But we found the opposite relationship for the business-experienced subsample. With the business-experienced subsample, high perceived entrepreneurial passion was associated with higher postpresentation scores on all four assessment variables, with statistically significant differences for commercial potential ( $p < .01$ ) and total evaluation ( $p < .10$ ). These findings provide empirical support for Dannels's (2003) observation that a highly technical audience may, in fact, be negatively affected by passionate-sounding presentations if they interpret it as showboating whereas a more business-oriented audience may see the passion exhibited during a presentation as the positive entrepreneurial characteristic of harmonious passion, or the classic fire in the belly.

## Conclusion

Within the areas of technology transfer, entrepreneurship, and private equity markets, there has been increasing interest in understanding the important role that presentation style, technique, and format have on decisions about funding. Many times the process of obtaining funding involves a screening process in which a select number of entrepreneurs are invited to present their proposals to a panel of decision makers.

We analyzed 22 videotaped proposals that were presented to a Department of Defense granting and technology transfer consortium. Our analysis is somewhat unique for several reasons. First, we examined a real-life funding decision; second, the presenters were all entrepreneurs of early-stage high-technology firms; third, unlike prior research, we used both prepresentation and postpresentation assessments by reviewers; and fourth, we focused on presentation behavior and style by using independent evaluators to assess the videos of the presentation.

From this analysis, we identified two noteworthy findings. First, we found that presentation behavior, form, and style did, in fact, appear to influence the reviewer panel's postpresentation assessment of the technology's merit, the firm's commercial potential, and the ability of the management team. In particular, perceived entrepreneurial passion, perceived entrepreneurial preparedness, keeping attention, and presentation attractiveness were all statistically significant in influencing the reviewers' assessment of the proposal. Second, we found differences in the impact of certain presentation behaviors depending on the backgrounds of the review panel. In particular, reviewers with real-life business experience appeared

to be much more positively influenced by entrepreneurial passion than were reviewers who were currently working as scientists or engineers.

Our research offers several important lessons for entrepreneurs who are presenting to funding groups, whether private equity investors or government granting agencies. First, the way the proposal is presented does matter, and it appears to matter a lot. For an emerging firm in a high-technology sector, it is important to understand that a good technology alone may not be sufficient to obtain funding. After all, technical merit is only one component that funding groups examine. Investors and grant reviewers also assess the emergent firm's commercial potential and the ability of the management team to successfully guide the organization. Our research suggests that decision makers use the behaviors they see in the formal presentation as a vehicle to assess these factors. Second, entrepreneurs need to develop a presentation style that includes tonal variety, body movement, and hand gestures in order to enhance the funding-decision makers' perceptions of entrepreneurial passion and preparedness. The presentation also needs to include techniques that encourage the listener to better absorb the presented information. Third, entrepreneurs must make sure that the presentation is attractive in terms of its visual content, but they also need to understand that there is a fine line when presenting to certain audiences. Not only can the technical aspects of presentation slides affect audience attention and retention, but these devices may also have a deeper psychological impact by influencing an audience's perception of presenter passion and intended meaning. But at some point, the perceived passion of the presenter may be seen more as showboating, which, in turn, could have a negative impact, particularly if the audience is more technically oriented.

This study must be considered exploratory and somewhat limited by sample size. The sample size of our study, however, is consistent with other recent experiments, such as Chen et al.'s (2009) well-cited study.<sup>2</sup> More important, however, is that our study is based on videotapes of real presentations—with real panels of decision makers—that resulted in real financial outcomes to the entrepreneurs. Analysis of real presentations made under such circumstances is rare in the literature.

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## Notes

1. In research with relatively small sample sizes using real data that allow for additional noise (as in medical experiments), a less restrictive statistical significance of  $p < .10$  for  $t$ -tests and regressions is often used (e.g., Paulssen & Bagozzi, 2009; Yang & Churchill, 2007).
2. The often-cited Chen et al. (2009) study used a relatively large sample size to develop their passion and preparedness scale (which we used in our study), but their analysis of entrepreneurial passion and preparedness during a presentation was based on only 31 presentations before judges during a university business-plan competition. From these judges, there were 159 completed postpresentation evaluations. Our study had 22 presentations resulting in 112 prepresentation evaluations and 112 postpresentation evaluations. Since Chen et al.'s sample was based on a student business competition, few, if any, of the business plans were likely to be high technology in nature.

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