



FORM INCEPTION TO EXECUTION: DEVELOPMENT OF ADOLESCENT IDEAS INTO CREATIVE SUCCESSFUL ENDEAVORS

*Início do formulário para execução: Desenvolvimento de Ideias para Adolescentes em
Empreendimentos de Sucesso Criativos*

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ABSTRACT

The creative sense of new ideas is often not realized due to a dearth of thoughtful consideration of how to brand these ideas meaningful after their inception. What happens between idea generation and implementation—during what we call the *idea development* phase—has often been overlooked. To support idea creators in successfully materializing their “adolescent” ideas, we suggest a theory about diverse activities that idea creators can utilize to specify, further progress, or improve an idea in the phase of idea development process. Inspired by adolescence development learning, our model reveals the different physiological, psychological, and emotional developments that help to take ideas forward after they have been generated. The study contributes to the literature on creativity and innovation by more closely considering what happens to ideas in their development phase and by revealing how ideas can be improved so that the realistic and best one is selected for execution.

Keywords: idea generation, adolescence, idea development, creativity, idea implementation

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RESUMO

O senso criativo de novas idéias geralmente não é percebido devido à falta de consideração cuidadosa de como marcar essas idéias como significativas após o seu início. O que acontece entre a geração e a implementação de idéias - durante o que chamamos de fase de desenvolvimento de idéias - muitas vezes foi esquecido. Para apoiar os criadores de ideias a materializar com sucesso suas idéias "adolescentes", sugerimos uma teoria sobre diversas atividades que os criadores de ideias podem utilizar para especificar, avançar ainda mais ou melhorar uma idéia na fase do processo de desenvolvimento de idéias. Inspirado pelo aprendizado do desenvolvimento da adolescência, nosso modelo revela os diferentes desenvolvimentos fisiológicos, psicológicos e emocionais que ajudam a levar as idéias adiante depois que elas são geradas. O estudo contribui para a literatura sobre criatividade e inovação, considerando mais de perto o que acontece com as idéias em sua fase de desenvolvimento e revelando como as idéias podem ser melhoradas para que a melhor e mais realista seja selecionada para execução.

Palavras-chave: Geração de idéias, Adolescência, Desenvolvimento de idéias, Criatividade, Implementação de idéias.

INTRODUCTION

Companies frequently use formalized innovation processes to structure all activities from start to deployment of an idea (Garud, Tuertscher, & Van de Ven, 2013). Commonly used processes include stage-gate models (Cooper, 2008), design-thinking ((T. Brown, 2008), and lean start-up approaches (Blank, 2013). These processes are usually concerned with the generation, the further elaboration and development, and finally the implementation of ideas. Companies structure their innovation process into several phases so as to gradually reduce uncertainty and the risks that are associated with an idea. At Shell's Game Changer innovation program, for instance, people who generate promising ideas will receive initial funding to further develop and improve their ideas. At the end of the innovation process, a final proof-of-concept review will be conducted. When passed successfully, the idea can be implemented within or outside of Shell (Hamel, 1999; Morten T Hansen & Birkinshaw, 2007). The process of improving ideas over time is not unique to organizations such as Shell. Car manufacturers, for instance, need several years to develop and improve a new engine from the initial idea to the final installation in cars (Goto et al., 1994). The publishing process of academic articles serves as another example. After submitting a first manuscript, reviewers provide authors with comments and feedback about how they could improve their idea. Thus, before the idea can be implemented and published, it needs to be further developed and improved.

Improving ideas—during what we call the *idea development* phase—is a crucial process in which ideas move from conception to implementation (Garud et al., 2013). The question of what needs to happen to ideas after they have been generated and before they can be implemented, however, has received very little attention from creativity and innovation scholars alike. On the one hand, the central focus of creativity research is on studying the conditions that help people to generate new ideas (Amabile, 1988; George, 2007). On the other hand, research on idea implementation concentrates on unpacking whose ideas are selected and subsequently implemented (Baer, 2012; Reitzig & Sorenson, 2013) and not on how the initial idea can be further improved. Both literature streams hardly focus on the ideas themselves, let alone how ideas can and should be further developed and improved after they have been generated (Kornish & Ulrich, 2014). The present study therefore extends earlier research in this direction and develops a model about how ideas may successfully develop in the phase between idea generation and idea implementation.

For our theory of how ideas successfully transition into innovation projects, we draw inspiration from and build analogies to the literature on adolescence (Lerner & Galambos, 1998; Steinberg & Morris, 2001), which marks the “transition from childhood to adulthood” (Spear, 2000). Adolescence is a period in which several important developments take place and milestones are reached. Young adults develop physically, psychologically, and socially; they acquire the tools to assume the roles and responsibilities of an adult (Ernst, Pine, & Hardin, 2006). Translating these insights to the idea development phase helps us to identify milestones in the idea development phase. Cultivating the theoretical foundations of how ideas develop is important because many companies are confronted with an innovation paradox: They focus on, and are often good at, creativity and idea generation; but they are let down by the implementation of ideas. While the reasons for a failure in implementing an idea is often sought at the level of the idea inventor (Baer, 2012) or the organization (Axtell et al., 2000; Frese, Teng, & Wijnen, 1999), we argue that a lacking understanding of the decisive dynamics in the idea development phase may very well be one of the explanations of this paradox. Much of the previous research in this domain concentrated on idea generation *or* idea implementation. Instead, we theorize about how ideas develop in between these two phases. We propose that in the idea development phase, a focus on physical, psychological, and social developments of an idea will make the idea better, leading eventually to successful implementation. More attention to the idea development phase advances the theory on creativity and

innovation in two ways. First, after much important work has been done to further our understanding of the people and contexts that are conducive to creativity and innovation, theorizing about ideas has faded into the background (Goldenberg, Lehmann, & Mazursky, 2001; Litchfield, Ford, & Gentry, 2014). Our theory puts ideas back into the spotlight and argues that a better understanding of ideas and how they can be cultivated in the idea development phase is critical for organizations to select the best ideas for implementation, instead of inferior ones. Second, studying the idea development phase provides novel insights into a critical innovation phase which frequently has been ignored by previous researchers. We propose several important areas of improvement in this phase which we argue can be responsible for the successful implementation of ideas at a later point in time. Our theory helps organizations to design strategies that support idea generators to develop and subsequently materialize their good ideas.

1. Ideas and Idea Development

1.1 Ideas

Before we begin our discussion of how ideas can be improved in the idea development phase, it is important to delineate our conceptualization of ideas. Once an idea is generated, it oftentimes is just a mere thought, a raw concept, which needs to be worked out further (Kornish & Ulrich, 2014). Ideas “may be poorly defined, inconsistent, or apparently inappropriate” (Skilton & Dooley, 2010, p. 120). Most ideas, however, include one of the following three dimensions. First, in its core, ideas address a certain problem or need which exists because of a deviation from what is desired to what is currently existing (Baer, Dirks, & Nickerson, 2013). Second, Oxford dictionary defines - an idea offers a thought or suggestion to a possible course of action. In other words, as argued by Kornish and Ulrich (2014, p. 14) an idea entails a solution which tackles the problem or need. It is “an opportunity to create value through further investment.”. Finally, an idea describes an idealized situation in which the initial problem is solved or the need is satisfied. Thus, an idea presents a future state which entails a positive change from the status quo.

1.2 Idea Development

The idea development process—which others (Kijkuit & Van Den Ende, 2007; Litchfield, Gilson, & Gilson, 2015; Perry-Smith & Mannucci, 2017) have also coined “idea refinement” or “idea elaboration”—encompasses a phase in the innovation process which takes place after an idea is generated but before it is implemented. During the idea generation phase, a raw idea is formulated for the first time (Amabile, 1988; Khurana & Rosenthal, 1998). To conduct this task, creative thinking is particularly useful (West, 2002a, 2002b). Whereas idea generation is often considered the first step in an innovation process, idea implementation marks its end (Baer, 2012). Idea implementation is primarily concerned with turning an idea into a tangible product, service, or process (Perry-Smith & Mannucci, 2017). This is where others need to be persuaded of the value of an idea and where project pre-planning takes place (Kijkuit & Van Den Ende, 2007; West, 2002b). Idea development, then, connects the idea generation and implementation phase. In this phase it is important that the idea further develops into a more concrete proposal (Kijkuit & Van Den Ende, 2007; Perry-Smith & Mannucci, 2017). It should become tangible enough so that it can be assessed whether the idea should be implemented or not (Litchfield et al., 2015).

In fact, when ideas are still in a raw version, it is very difficult to forecast their potential for an organization (Berg, 2016). It is only when an idea is put on the market that one can assess the true value of that

idea (Fleming, 2001). When it comes to the evaluation of new ideas, researchers have started to document that people in different roles (i.e., idea generators versus managers) have different strengths and weaknesses with respect to predicting the outcome of an idea (Berg, 2016). Others have highlighted that idea evaluation is a subjective process where, for instance, several in-group biases affect whether or not an idea is selected for implementation (Reitzig & Sorenson, 2013). One way to address the difficulties and challenges of idea selection, we argue, is to pay more attention to improving ideas before they are evaluated.

Despite the fact that studies investigate idea quality in often very different ways, and usually only at the time when the idea is presented to a selection audience, there are some indications that the general quality of an idea as well as improvements in quality should matter a great deal for idea selection. For instance, there are studies which show that proxies for idea quality, the innovativeness or novelty of an idea (Rietzschel, Nijstad, & Stroebe, 2006), are positively related to idea selection (D. D. Deichmann & van den Ende, 2014; Schemmann, Herrmann, Chappin, & Heimeriks, 2016). Other studies do not examine selection directly but show that for those ideas which were selected, an initially evaluated quality level will be positively associated with eventual market performance. For example, Kornish and Ulrich (2014) demonstrate that both the quality of “raw ideas,” thus the quality of ideas after they have initially been generated, as well as the quality of the final ideas are positively associated with product sales. However, since it remains difficult to evaluate the quality of ideas when they were just generated (Berg, 2016) and because it is safe to assume that the majority of the submitted ideas can—and probably should—be improved, further idea development is inevitable.

Scholars, however, still lack a profound understanding of how an idea may actually develop and be further improved. To shed new light on these dynamics, we use insights from the broad literature about adolescent development (Lerner & Galambos, 1998; Steinberg & Morris, 2001). Adolescence is the period in which children transition into adults (Spear, 2000). It is a phase in life characterized by several physical, psychological, and social developments. Puberty instigates a flood of hormonal changes which contribute to physical developments such as increase in height, weight, and body proportions as well as sexual maturation (Ernst et al., 2006; Lerner & Galambos, 1998). Psychological changes during adolescence include improvements in cognitive abilities and abstract thinking. Self-concepts become better organized. In addition, young adults search for their own identity and discover who they really are (Steinberg & Morris, 2001). In that process, however, they may also show higher levels of risk-taking (Crosnoe & Johnson, 2011; Johnson, Crosnoe, & Elder, 2011). Finally, adolescence is a period of many social developments which include the emotional separation from parents and the development of friendship and romantic relationships (Crosnoe & Johnson, 2011; Ernst et al., 2006). By making analogies to these physical, psychological, and social developments in adolescence, we theorize about how the fuzzy and uncertain phase that ideas have to go through in their development process can be used for idea improvement.

2. A Model for How Ideas Develop Successfully

In this section we develop our theoretical model which highlights the different activities that may further develop and improve ideas. Inspired by insights from adolescence development, we argue that for ideas to become successful innovation projects, they need to make physical, psychological, and social advancements (see Figure 1 for a visual overview). The first path towards successful idea implementation concerns the physical development of an idea, or, in other words, its comprehensiveness and functionality. The second path relates to psychological developments. This translates to an idea’s orientation and its alignment with the organization. The final path towards successful implementation is to advance on a social level. This concerns development activities targeted at further embedding and interconnecting an idea, while decoupling from the

idea generator (i.e., the parent). Following all paths should translate into increased chances of an idea being selected for implementation, and indeed for successful implementation.

2.1 Physical Development of Ideas

Physical maturation is a key element when becoming an adult (Crosnoe & Johnson, 2011). Likewise, fresh ideas need to grow their “body mass” and further develop their functionality for them to succeed. One way to grow an idea is to establish a higher level of comprehensiveness. Comprehensiveness simply means that all aspects of an idea are being considered. This can mean, as Baer et al. (2013, p. 199) argue, that “alternative, relevant problem formulations are identified with respect to an initial symptom or web of symptoms.” Developing the comprehensiveness of an idea increases peoples’ understanding of the solution that an idea offers for a given problem or need (Baer, 2012; Baer et al., 2013). For instance, besides describing the idea and how it works, one also illustrates potential risks or anticipated difficulties with respect to implementing the idea.

Consider an idea about a new electric engine. To be comprehensive, the inventor should not only focus on illustrating how the battery works, but also provide information about its limitations in terms of reach. Another example is the publishing process of an academic paper. Here, the idea that is at the core of the paper, for example a research question, should be described. However, to appeal to an academic audience, the paper also needs a theoretical background, a section (if applicable) on methods and empirics, and a discussion section. Only mentioning the research question, even if it is a great question, will hardly suffice to get the idea implemented eventually. Improving the comprehensiveness of an idea greatly benefits idea development: ideas will become more complete, because different perspectives, views, and scenarios are taken into account. Thus, the quality of ideas improves when people work on enhancing the comprehensiveness of their ideas.

Hypothesis 1: Developing the comprehensiveness of an idea is positively associated with idea improvements.

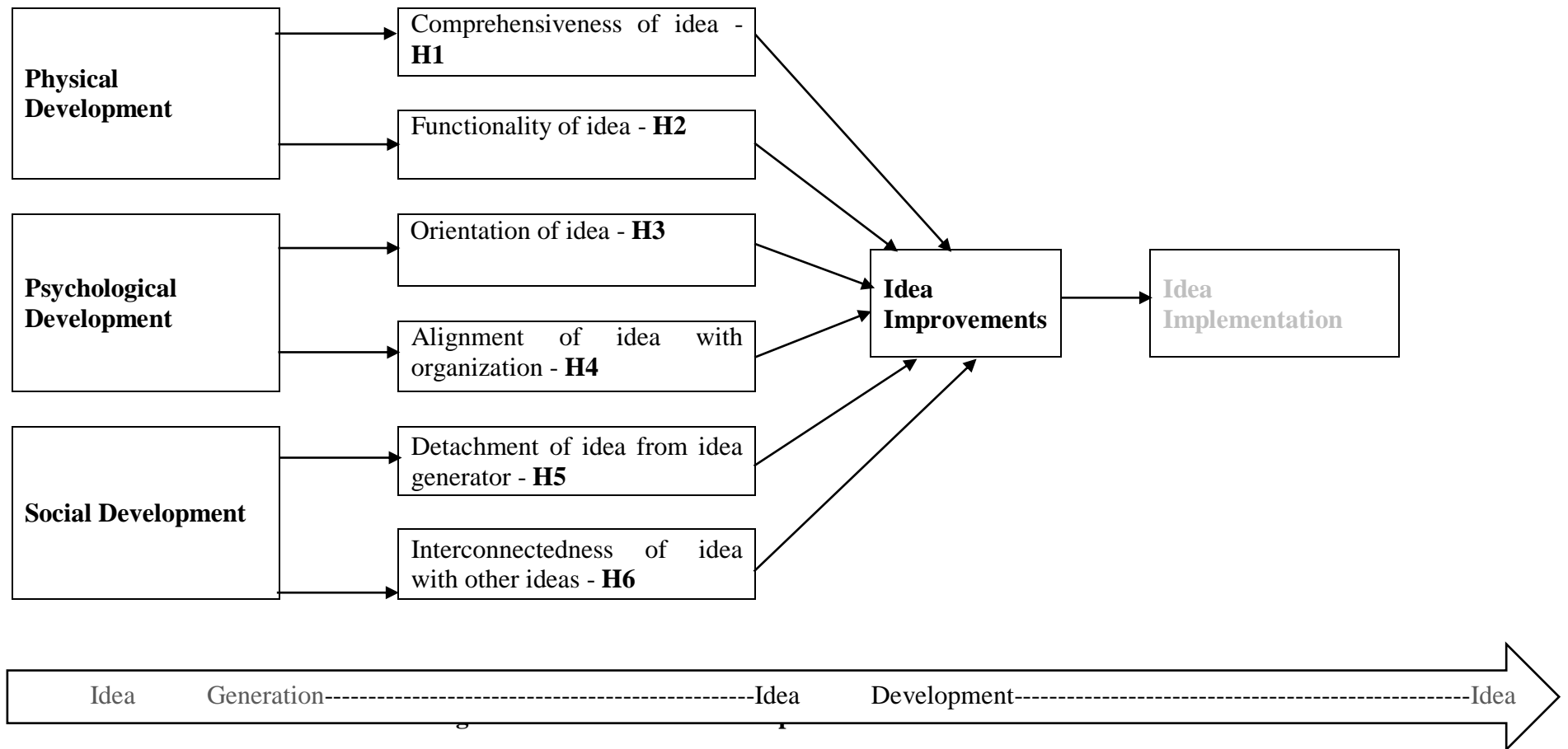


Figure 1. Model of Idea Development Process after Creation

A second way of physically maturing an idea is to further develop its functionality, which includes its value and feasibility. Developing an idea's functionality relates to demonstrating the desired future state that an idea will afford. By exploring the functionality of an idea, idea generators not only clarify the value of an idea but also investigate whether or not it is feasible and thus can be translated into a product or service that can be launched on the market (Kristensson, Gustafsson, & Archer, 2004; Litchfield et al., 2015; Rietzschel et al., 2006). Therefore, working on developing an idea's functionality is considered to be a key activity in the idea development process (Castaner, 2016; Ford & Sullivan, 2004). Indeed, Litchfield and colleagues (2015) argue that representations of an idea by means of boundary objects, prototypes, or a vision "allow different constituencies to 'see' aspects of the idea that relate to their functional orientation" (p.15). Recognizing and better understanding the functionality of an idea, in turn, helps other people to enroll in and further contribute to an idea (Garud et al., 2013).

Getting back to the example of the new electric engine, working on idea functionality could mean to come up with a first prototype. This prototype can be used to illustrate the features and characteristics of the engine to members of the design, marketing, and operations department. These constituencies then can see, discuss, and comment on whether the new engine offers any marketable value. In addition, they can start to estimate, for instance, the changes that are necessary so that the current machines can still be used to manufacture the new engine. When publishing an academic paper, developing the functionality of an idea could mean to work on the paper's theoretical contribution. This allows the author team to judge a working paper's potential in targeting top journals. In addition, the team can estimate the idea's feasibility in terms of developing the paper into a publishable form. Here, the team could agree that it is feasible to further develop the idea and adapt the working paper for publication, based on the idea's functionality. Thus, developing the functionality of an idea, we argue, improves an idea's quality.

Hypothesis 2: Developing the functionality of an idea is positively associated with idea improvements.

2.2 Psychological Development of Ideas

Adolescence is a period of many psychological changes (Crosnoe & Johnson, 2011) where, among others, an often "stormy" personality transitions into a more stable and confident one. In addition, cognitive capabilities such as abstract thinking are developed. When drawing parallels to the development of ideas, these psychological developments are reflected in two important factors. First, initial ideas are often perceived as having no clear orientation. They lack focus and are often too complex to be conveyed easily. This implies that few people understand all aspects of the idea and will therefore find it difficult to comment on it or give feedback about how it could be improved (Di Gangi & Wasko, 2009; Haas, Criscuolo, & George, 2015). When ideas have no clear orientation, it is also difficult to understand how the different aspects of an idea relate to each other. In other words, the idea lacks boundaries, which makes it hard for others to comprehend the idea in its entirety.

To illustrate, consider again the new electric engine. Here, it is important to clearly describe the engine's aim, which is to run on electricity only. This means that the engine is not designed to be the fastest, most economical, or best sounding engine. In this way, putting boundaries on the idea helps others to comprehend the idea and judge its potential. Another example is that of an academic working paper in which an author tries to contribute to the literature on creativity, innovation, process models, and project management. An author of such a paper can improve the idea's orientation by prioritizing or limiting the number of contributions the paper makes to different literature streams. The author could, for instance, prioritize the contribution of the paper to the creativity literature. In so doing, the author puts boundary demarcations on the idea (Whetten, 1989). This conceptual parsimony also helps to target specific colleagues with expertise in the area of creativity. Arguably these colleagues should be in a better position to provide high-quality feedback: They understand the theoretical framework of the working paper and can assess whether or not certain changes in the paper will lead to a more significant contribution to the creativity literature. We therefore suggest that the

quality of an idea will improve in the idea development process when the idea develops into one with a clear orientation.

Hypothesis 3: Developing the orientation of an idea is positively associated with idea improvements.

A second way for ideas to psychologically advance is to develop a closer *alignment* with the organization, reflecting the abstraction phase in adolescence. For example, van Buuren, Eshuis, and Bressers (2015) describe how a better alignment between innovative concepts and organizational values greatly helped in actually implementing an idea. This echoes Rogers (1962) notion of idea compatibility. Here, an idea needs to be perceived as being consistent with organizational values, past experiences, and needs. Communicating alignment helps the idea to stand out, become more recognizable and showcase its fit with and applicability to the field or discipline in question (Csikszentmihalyi, 2014). Alternatively, when organizations fail in aligning their ideas and strategies, they are bound to encounter problems in their innovative endeavors, for example high failure rates (Pisano, 2015).

Consider again the new electric engine example. When enhancing the idea's alignment, the developing team might think of how the electric engine fits the company's current strategies. For example, Tesla declares that its mission is to "accelerate the world's transition to sustainable energy" (Tesla, 2018). A new electric engine fits this company's strategy, because electric engines are more sustainable than fossil-fueled engines. In case of the academic paper, aligning the idea with current strategies might mean that the author team should consider if and how the idea and associated working paper fit with the current research portfolio of the authors and the respective departments' portfolios. Research shows that the context scientists are embedded in influences idea success (Birkinshaw, Hamel, & Mol, 2008), suggesting that contextual factors such as department policies and strategies matter when publishing academic papers. Improved alignment with an authors' portfolio and departments' portfolio should therefore enhance overall idea improvement. To sum up, if an idea is well aligned with an organization's strategy, and in addition this alignment is clearly communicated, the likelihood of idea improvement increases.

Hypothesis 4: Developing alignment of the idea with the organization is positively associated with idea improvements.

2.3 Social Development of Ideas

Besides physical and psychological developments, adolescence is also characterized by important social changes and milestones. One of these social developments is that young adults either distance themselves from their parents or renegotiate their relationship with their parents so as to gradually establish their own identity (Crosnoe & Johnson, 2011). We argue that for ideas to successfully develop, they need to go through a similar process of *detachment* where the idea generator is no longer considered as the prime "owner" of the idea. The literature defines psychological ownership as a "state in which individuals feel as though the target of ownership or a piece of that target is 'theirs'" (Pierce, Kostova, & Dirks, 2003, p. 86). This kind of ownership may prevent the further development and improvement of ideas for several reasons. First, psychological ownership may provoke territorial behavior concerning an idea (G. Brown, Crossley, & Robinson, 2014; G. Brown, Lawrence, & Robinson, 2005; Das & Chakraborty, 2018). If this is the case, individuals mark the idea as their own and are less open towards sharing it with others. The result can be that idea generators will receive little or no feedback to further develop and improve their idea. Second, psychological ownership can also mean

that idea generators become less willing to change their idea. Instead, they will protect, defend, and fence off feedback and suggestions for improvement. While this prevents others from claiming ownership over an idea, it also follows that improvements to an idea can hardly take place and that, instead, the status quo of an idea is maintained (Baer & Brown, 2012). In other words, in the idea development process, to some degree it is necessary for ideas to get separated or detached from their original idea generator. Only then can other people start investing their time and energy into further developing the idea because they also feel ownership over the idea. When ownership can not only be attributed to the initial idea generator, more people get involved and care about the idea, making the idea development process a truly collective effort (Di Gangi, Wasko, & Hooker, 2010). Earlier research showed that this collective effort and investment is key for improving an idea to the extent that it will be selected for implementation (D. Deichmann & Jensen, 2018; A. B. Hargadon & Bechky, 2006).

Getting back to the example of the new electric engine, detachment would mean that the idea generator at some point transfers the further development of the engine as part of a car to a team. Implementing the idea of the electric engine requires to integrate it into a car, which means that other specialists, such as designers and technicians, need to be involved. When the engine is allowed to further develop in a team of diverse specialist, its potential for successful implementation should be enhanced. For the academic paper, detachment from the idea generator means that the person who initiated the collaboration and developed the research question—typically the first author—allows his or her co-authors to get involved with the paper's further development. The team can then collect diverse feedback, question implicit assumption, and collectively improve the paper. This improvement will increase the paper's chances for successful publication. In sum, the above argumentation leads us to propose that ideas improve when becoming detached from the idea generator.

Hypothesis 5: Detaching the idea from the idea generator is positively associated with idea improvements.

Another important social development in adolescence concerns the primacy of peer relationships including the development of friendships and romantic relationships (Ernst et al., 2006). For our purpose and context, this translates into the interconnectedness of ideas. Interconnectedness refers to the degree to which an idea relates to earlier ideas and other concepts. Here, ideas represented by words and concepts are linked in a network (Moser, Birkholz, Deichmann, Hellsten, & Wang, 2013). The embeddedness of ideas is closely intertwined with the social network of the people involved (Cointet & Roth, 2009). The interconnectedness of ideas is crucial for two reasons. First, showing how an idea relates to earlier ideas and concepts forces idea generators and other people who are involved in the development process, to consider the strength and weaknesses of what is already existing. Based on this, they can better formulate how existing ideas do not sufficiently address the experienced problem or need and thus clarify the need for or contribution of their idea (Corley & Gioia, 2011). Second, by establishing links to what is already existing, one can help other people to compare the new idea with existing ideas and concepts (Jensen, Hienert, & Lettl, 2014). This, again, helps to illustrate how urgent a problem or need is but it also facilitates the further development of an idea, because people have a reference point to which they can compare a new idea. They are familiar with the vocabulary in that area and therefore do not have to deal with a completely new vocabulary or area of expertise (Morten T Hansen, 1999). The development of a prototype can facilitate this process as it serves as a boundary object which makes it easier for people to share knowledge and feedback about a new idea (A. Hargadon & Sutton, 1996). To that end, ideas will more likely improve and exhibit a higher quality in the idea development process when there is a higher idea interconnectedness.

In case of the new electric engine, connecting the idea to existing ideas might mean to showcase connections with other company products. For example, Tesla produces an electric engine but also battery energy storage. These two products are related, enabling developers and designers to draw on familiar knowledge and vocabularies when further developing the idea. Also, idea interconnectedness helps the engine team to clearly outline the relevance and contribution of the new electric engine. Similarly, when working on a new academic article, interconnectedness means that an author reviews the literature in a certain field and summarizes the current state of art. This is important to show how the idea is embedded in the web of existing ideas (Litchfield et al., 2015; Moser et al., 2013). Also, showing how an idea connects to other ideas enables the authors to highlight gaps in existing theories or linkages between theories, thus improving the idea's potential for a major theoretical contribution. Based on the above argumentation, we posit that idea interconnectedness should boost idea improvement.

Hypothesis 6: Developing the interconnectedness of an idea is positively associated with idea improvements.

An overview of the propositions and the illustrative examples is presented in Table 1.

Table 1. Outline of Expressive Examples of the Idea Development Process

Hypothesis		Power-driven Engine	Research paper
Physical Maturity			
H1	Developing the generalization of an idea has a significant association with idea progresses.	Describe how the battery works, and also provide information about its uses, battery, capacity, performance and limitations.	Along with describing the research problems or questions, work on a literature, methodology and empirics, and a discussion with future research
H2	Developing the functionality of an idea has a significant association with idea improvements.	Make a trial archetype which can be used to demonstrate the features and characteristics of the engine to members of the design, marketing, operations and sales department.	Put effort on the paper's theoretical and practical contributions to judge its potential to target top journals and justify the idea's feasibility to develop the paper into a publishable form.

Psychological Maturity			
H3	Developing the orientation of an idea has a significant association with idea advancements.	Clarify the devices purpose, e.g., run with electricity only. This means that the device is not designed to be the fastest, most economical, or best sounding one.	Rank the number of contributions the paper makes to different literature streams with specific edge.
H4	Developing alignment of the idea with the organization has a significant association with idea improvements.	Describe and communicate the way, how the device supports and aligns with the company's ongoing strategic choices.	Pondering whether the research paper align with the current and on-going research phenomena and how.
Social Maturity			
H5	Detaching the idea from the idea originator has a significant association with idea developments.	Ensure supplementary development as a part of a car, transferring to a team with designers and technicians.	Further develop the research idea by involving with co-authors, to assemble assorted criticism or comment for improvement
H6	Developing the inter-connectedness of an idea has a significant association with idea improvements.	Demonstrate linkage with other company products, to enable makers and designers to draw on accustomed familiarity and framework the significance of the new power-driven engine.	To highlight research gaps in established theories, review the literature in a certain field and outlines the current state of art to escalate the idea's potential for a rigor contribution in relative field.

3. Discussion

As organizations seek to be more innovative, and encourage their employees to not only come up with new ideas but also to implement those ideas, it is perhaps time to revisit how ideas develop between idea generation and implementation. Using adolescence as an analogy for a period where—similar to idea development—several critical changes take place and milestones are reached, we proposed that paying attention to the physiological, psychological, and social developments concerning an idea will allow for important improvements to be made to ideas when they are in a phase of development. Our model also illustrates the factors to consider so as to boost the physiological, psychological, and social development of an idea. Shedding light on these factors allows idea generators, peers, and managers to appreciate what is needed for ideas to improve and to support each other in the task of successfully moving an idea from the generation phase to its implementation.

Our model and theory about the successful improvement and further development of ideas provide a number of important contributions for the creativity and innovation literature. Firstly, by focusing on the necessary development an idea needs to go through for it to be implemented, we shift the discussion to ideas as an object of interest. Scholars of the creativity and innovation literature have an increasing understanding of the different individual, team, and organizational factors that facilitate creativity and innovation (Anderson, Potočník, & Zhou, 2014; Das, Yi, & Uddin, 2018; George, 2007; Shalley & Gilson, 2017). However, there is little theorizing about ideas themselves. The sparse work that has been done on this subject often focused on defining and categorizing different types of ideas (Litchfield et al., 2015; West, 2002a). Instead, our investigation of how ideas successfully transition from their initial inception to final implementation starts off with unpacking the core elements of an idea before illustrating the different ways of how ideas can be improved. Ideas are the starting point of any innovation journey. A closer examination of ideas and how they develop and improve over time will therefore advance our understanding of the innovation process more generally.

Secondly, much of the earlier literature focused on idea generation, and to some degree on idea implementation. Organizations, too, often invest millions of Euros in becoming more creative; they frequently run brainstorm sessions and recruit employees who are expected to generate many good ideas. Investing in creativity and idea generation, it is commonly thought, should result in organizations that are more innovative and competitive. However, the generation of ideas does not automatically result in successful innovation projects. Many questions about what needs to happen to ideas after they have been generated and before they can be implemented, have not yet been addressed. Research on creative revisions and the role of feedback to further improve already generated ideas is just emerging (Grimes, 2018; Harrison & Rouse, 2015). Our conceptual framework which highlights the different psychological, and social changes an idea should undergo for it to be implemented provides a holistic account of the idea development phase. For organizations this means to pay more attention to the activities that facilitate further idea improvement before implementing an idea.

More specifically in third, organizations may want to carefully revise their innovation processes (Garud et al., 2013). Innovation process models such as the stage-gate approach (Cooper, 2008) provide an overall framework of how the management of ideas from start to deployment can be approached. While these processes provide structure and bring order to an oftentimes fuzzy innovation process, they also have been criticized for their inflexibility and stringent selection criteria which may hamper learning (Garud et al., 2013; Sethi & Iqbal, 2008; Sethi, Smith, & Park, 2002). More recent methodologies such as the lean start-up approach focus more strongly on the merits and necessities of experimentation and learning before an idea is executed (Blank, 2013). Our model highlights the importance of further developing and improving ideas. Drawing parallels to the literature on adolescent development, we provide a theoretical account of why and how a focus on physiological, psychological, and social developments concerning an idea help idea generators and their team to specify, further advance, and improve an idea in the idea development process.

Finally, our study contributes to the literature on innovation portfolios. S. L. Brown and Eisenhardt (1997) found that one of the answers why some organizations have successful product portfolios while others do not is

because the former are more concerned with the future and less occupied with the past or catching-up. Successful firms were “frequently probing the future” by for instance launching experimental products to find out how they are perceived in the market and to learn from these low-cost experiments. We extend this model by breaking down our analysis to the level of an idea. In so doing, we illustrate the activities that idea generators can engage in to further develop and improve their ideas. When ideas enter an idea development process they are still in a very raw—and indeed fragile—state. Before they can be implemented or tested in the market, these ideas need to further mature. Our model highlights the different paths and activities necessary for this to take place and suggests that idea development processes are critical for firms to create successful innovation portfolios.

3.1 Directions for future research

Our theory and propositions provide a number of interesting directions for future research. To begin with, we encourage researchers to empirically test the different theoretical mechanisms we proposed. For instance, future research could explore whether detaching the idea from the idea generator indeed decreases the idea ownership of the idea generator and thus allows other people to develop ownership feelings, too, which, as we suggested, should lead to idea improvements. A longitudinal research design seems most appropriate in this regard. A useful extension to our model would also be to examine more closely the antecedents of the processes we suggested lead to idea improvements. For instance, we argued that alignment of the idea with the organization should facilitate the improvement of an idea and thus its selection. To create alignment, a deep understanding of the needs and values of an organization is necessary. Organizational tenure but also the social network of idea generators and their collaborators can be critical in this respect. A cohesive social network, for instance, could be a signal of idea generators’ and their collaborators’ embeddedness in an organization. This could make them more aware of the challenges an organization is facing and help them in aligning their idea with those challenges (Obstfeld, 2005; Uzzi, 1997).

When applying our model, one also has to keep in mind that idea quality is socially constructed—what some people perceive as high quality is a low-quality idea for others. So, the value of an idea lies in the eye of the beholder and is contingent on the other ideas that are currently available (Shalley, Gilson, & Blum, 2000; Shalley, Zhou, & Oldham, 2004). What seems creative and new to one person might be a useless imitation to another (Van de Ven, 1986; Van de Ven & Rogers, 1988). This leaves room for researchers to further explore how idea quality is actually perceived by others and how that perception can be shaped. Based on our model, one could delineate between idea improvements that are a result of actual changes made to an idea vis-à-vis those that relate to how the value of an idea is communicated and promoted to relevant stakeholders. For instance, while developing the comprehensiveness of an idea is likely to be a result of actual changes made to an idea, developing alignment of an idea with the organization is often a matter of framing and communicating.

Finally, for our theorizing, we focused on the different activities that help idea generators further develop and improve their ideas independent of context within which these developments take place. Future research could explore the conditions under which the idea development process unfolds in more or less difficult ways. One example concerns the composition of the team that develops the idea. When team members do not know each other very well, they might have different views about what constitutes a high-quality idea because they have different backgrounds and different technical expertise (Jeppesen & Lakhani, 2010). In addition, team members that do not know each other very well need to develop shared heuristics to communicate (Morten T Hansen, 1999). Developing this shared heuristic or shared understanding can be very time consuming and can distract a team from further developing and improving an idea.

Conclusion

In conclusion, our study reveals the different psychological, and emotional developments that help to take ideas forward after they have been generated. Our model—inspired by adolescence development—encourages creativity and innovation scholars alike to more closely consider what happens to ideas in their development phase and to pay more attention to revealing how ideas can be improved so that the best ones are selected for implementation.

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