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The ABC for Studying the Too-Much-of-a-Good-Thing Effect: A Competitive Mediation Framework Linking Antecedents, Benefits, and Costs

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Abstract

The too-much-of-a-good-thing (TMGT) effect occurs when an initially positive relation between an antecedent and a desirable outcome variable turns negative when the underlying ordinarily beneficial antecedent is taken too far, such that the overall relation becomes nonmonotonic. The presence of the TMGT effect incites serious concerns about the validity of linearly specified empirical models. Recent research posited that the TMGT effect is omnipresent, due to an overarching meta-theoretical principle. Drawing on the competitive mediation approach, the authors of the present study suggest an antecedent-benefit-cost (ABC) framework that explains the TMGT effect as a frequent but not omnipresent issue in empirical research and integrates a variety of linear and nonlinear relationships. The ABC framework clarifies important conceptual and empirical issues surrounding the TMGT effect and facilitates the choice between linear and curvilinear models. To avoid serious methodological pitfalls, future studies with desirable outcome variables such as, for example, task performance, job performance, firm performance, satisfaction, team innovation, leadership effectiveness, or individual creativity should consider the ABC framework.

Keywords

curvilinearity, too-much-of-a-good-thing effect, benefits, costs, competitive mediation

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Introduction

The too-much-of-a-good-thing (TMGT) effect occurs when an initially positive relation between an antecedent and a desirable outcome variable (e.g., task performance, job performance, firm performance, satisfaction, team innovation, leadership effectiveness, or individual creativity) turns negative when the underlying ordinarily beneficial antecedent is taken too far, such that the overall relation becomes nonmonotonic. Hence, the TMGT effect represents a case of curvilinearity in the context of desirable outcome studies. This kind of research makes up a major portion of organizational research, which seeks to understand, explain, and predict the conditions under which desirable outcomes are created. Recently, Pierce and Aguinis (2013) contributed to the discussion of the TMGT effect that they found to occur across numerous domains of organizational research. They posited that "*all* seemingly positive monotonic causal relations . . . reach a context-specific inflection point . . . after which they cease to be positive, resulting in an *overall pattern of curvilinearity*" (p. 317, italics added), due to the presence of an overarching "meta-theoretical principle" (p. 314). This conjecture is worrisome from a methodological perspective because linear[1] models, which are the de facto standard in research practice, cannot detect curvilinearity. Linear models also cannot identify limits to the improvements of desirable outcomes that result from increases in the respective antecedents. Hence, whenever the true effect of an antecedent variable changes directions at a certain level of the variable, linear models will misrepresent the true effect. In such situations, the practical recommendations derived from linear models are likely flawed and misleading (Luft & Shields, 2003). Similarly, Pierce and Aguinis (2013) imply that the vast majority of research about desirable outcomes—and thus a large fraction of organizational research—is seriously flawed.

Because of the far-reaching methodological implications of the study by Pierce and Aguinis (2013) and because of the high practical relevance of the TMGT effect, we believe that their arguments for and their generalization of the TMGT effect merit closer investigation. In this article, we approach the TMGT effect from the competive mediation perspective (Hayes, 2013; Hayes & Preacher, 2010; Zhao, Lynch, & Chen, 2010) to illustrate that the occurrence of the TMGT effect can be explained as the overcompensation of desired effects (benefits) by parallel and undesired effects (costs). We develop a three-times-three framework comprised of antecedents, benefits, and costs (henceforth referred to as the ABC framework) that accommodates the TMGT effect and highlights cases in which this effect can or cannot occur. From this framework, it follows that the TMGT effect is a frequent but not omnipresent issue and that its occurrence can be predicted based on conceptual analyses of the underlying cost and benefit functions. The ABC framework suggests that in the context of desirable outcome studies, the consideration of curvilinearity should become the rule rather than the exception, thereby supporting prior related claims (Luft & Shields, 2003; Pierce & Aguinis, 2013).

The ABC framework renders the TMGT effect methodologically manageable by providing a theoretical rather than meta-theoretical explanation for its occurrence. In addition, it has prescriptive value for conducting desirable outcome studies. In the following, we first illustrate how the ABC framework can guide theorizing with respect to desirable outcomes. Then, we show how the developed framework can be applied in empirical research, that is, how desirable outcome studies can be designed to provide deeper insight into the nature of the causal relations. We also discuss important paths for future research and preempt some expected counterarguments before concluding the article with a summary of the most important findings and possible limitations.

A Competitive Mediation Explanation of the TMGT Effect

We extend research on the TMGT effect by suggesting that the competitive mediation perspective can advance the current theoretical understanding and help researchers empirically analyze its

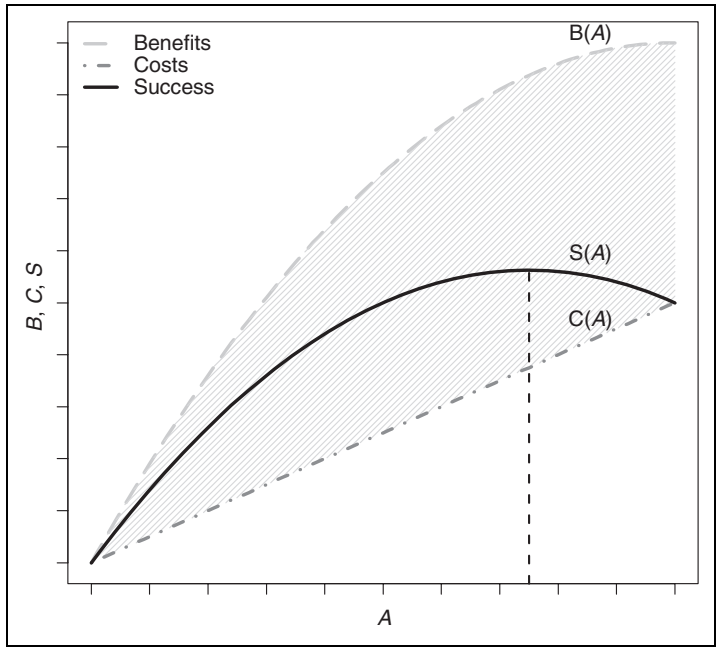


Figure 1. Exemplary decomposition of the too-much-of-a-good-thing effect.

occurrence. Specifically, we adopt the basic idea behind competitive mediation—that an overall effect results from the aggregation of multiple opposed effects (Zhao et al., 2010). Competitive mediation is generally said to occur when a mediated effect and a direct effect exist in parallel, pointing in opposite directions (Zhao et al., 2010). To investigate the TMGT effect, we look at the special case in which a dependent variable is affected by two (or more) mediators with opposite directionalities of influence, which are caused by a common antecedent variable. The competing mediators can be understood as benefits and costs of the antecedent. Accordingly, the term *benefits* will be used to denote desirable immediate outcomes and the term *costs* to denote any undesirable immediate outcomes, both *not* only in a direct monetary sense. We think of both the antecedent-benefit relationship and the antecedent-cost relationship as potentially curvilinear relations.

By using this perspective, the TMGT effect can be explained as follows: The TMGT effect exists in the context of an antecedent variable that simultaneously causes benefits and costs and occurs if at lower values of the antecedent the incremental benefits outweigh the incremental costs and at higher values of the antecedent the incremental costs outweigh the incremental benefits. From a competitive mediation perspective, the TMGT effect can then be interpreted as a (frequently occurring) special case of combining cost and benefit effects associated with an antecedent in a single dependent variable that is basically desirable.

Figure 1 illustrates this argument and exemplarily depicts benefits (B) and costs (C) that result from such an antecedent (A). For ease of reference, the difference between (or combination of) benefits and costs (i.e., benefits minus costs) can be labeled as *success* (S). The TMGT effect is hence observed within an antecedent-success relationship.

In the example shown in Figure 1, there is a success maximum beyond which the success variable falls again; it is located at the point where benefits and costs increase with the same slope. Indeed, it follows from basic calculus that at the maximum, *incremental* benefits and *incremental* costs must be equal (first-order necessary condition). At higher antecedent values, incremental costs are greater

than incremental benefits, so further increase in the antecedent is no longer desirable from the perspective of the *joint* view of benefits and costs, which is identical to the perspective of the aggregated success function. Hence, the observation that additional increases of the antecedent cause "harm" (Pierce & Aguinis, 2013, p. 314) beyond the maximum of the dependent variable is directly explained by the simultaneous consideration of benefits and costs; additional benefit is still created, but the additional costs overcompensate for it.

Antecedent-Benefit-Cost Framework

In the following, we consider four positive-valued, continuous variables A, B, C, and S, which, respectively, represent antecedents, benefits, costs, and success (as outlined previously). We assume $B(A)$ and $C(A)$ to be "well-behaved," strictly monotonic functions that represent the true effects of A on B and of A on C. B and C are commensurate (e.g., standardized) so that their joint effect can be aggregated in the success variable S.

As the first element of our ABC framework, we focus on the antecedent-benefit relationship ("benefit function") and consider three generic cases (although more complex forms are certainly possible): $B(A)$ is a straight line, $B(A)$ is convex, and $B(A)$ is concave. Instances of the three cases are shown by the dashed lines $B(A)$ in Figure 2. The base case of a straight line (middle column in Figure 2) occurs when every incremental increase in A is equally beneficial (i.e., a constant slope). The convex case (i.e., B increases more than linearly with increases in A; left column in Figure 2) reflects, for example, the network effect pattern in which each incremental gain in network size is more beneficial than all previous ones because of mutual connectivity.[2] The concave function (i.e., B increases less than linearly with increases in A; right column in Figure 2) indicates diminishing marginal returns.

The antecedent-cost relationship ("cost function") is the second element in our framework. As before, we distinguish three generic cases: $C(A)$ is a straight line, $C(A)$ is convex, and $C(A)$ is concave. Instances of the three cases are shown by the dot-dashed lines $C(A)$ in Figure 2. The straight line case (middle row in Figure 2) is the most established cost function in corporate practice. Here, the intercept represents fixed costs, which by definition are independent of A, and to which variable costs (slope multiplied by the amount of A) are added. The convex cost function (top row in Figure 2) is adequate when marginal costs increase with every additional unit of A, for example, if A is naturally scarce. The concave cost function (bottom row in Figure 2) is used in concepts found in the economics literature and consulting practice (e.g., economies of scale). Thus, each shape of both functions is feasible in practice.

Combining these generic cases of benefit and cost functions results in nine generic benefit-cost constellations. According to our previous competitive mediation explanation, the TMGT effect can be observed when benefits and costs are considered *jointly*, for example, as depicted in the aggregated "success function" (i.e., $S(A)$, the difference between $B(A)$ and $C(A)$) in Figures 1 and 2. However, empirical desirable outcome studies can also focus on benefit- or cost-type outcomes only, which is tantamount to estimating either $B(A)$ or $C(A)$ functions separately. In such situations, the TMGT effect will not be visible. For example, market share and sales are generally considered desirable outcomes and frequently investigated dependent variables (Richard, Devinney, Yip, & Johnson, 2009). However, under normal circumstances, these variables capture only benefits and no costs. Conversely, theories and empirical studies concerned with desirable outcomes can also concentrate on costs as the only dependent variable. For instance, Handley and Benton (2013) recently explained how control and coordination costs in global outsourcing relationships depend on task- and location-specific complexity; however, they did not attend to benefits. Of course, predicting a $B(A)$ (or a $C(A)$) function does not imply that no costs (or benefits) are generated by the antecedent variable. Rather, this type of studies simply does not investigate them.

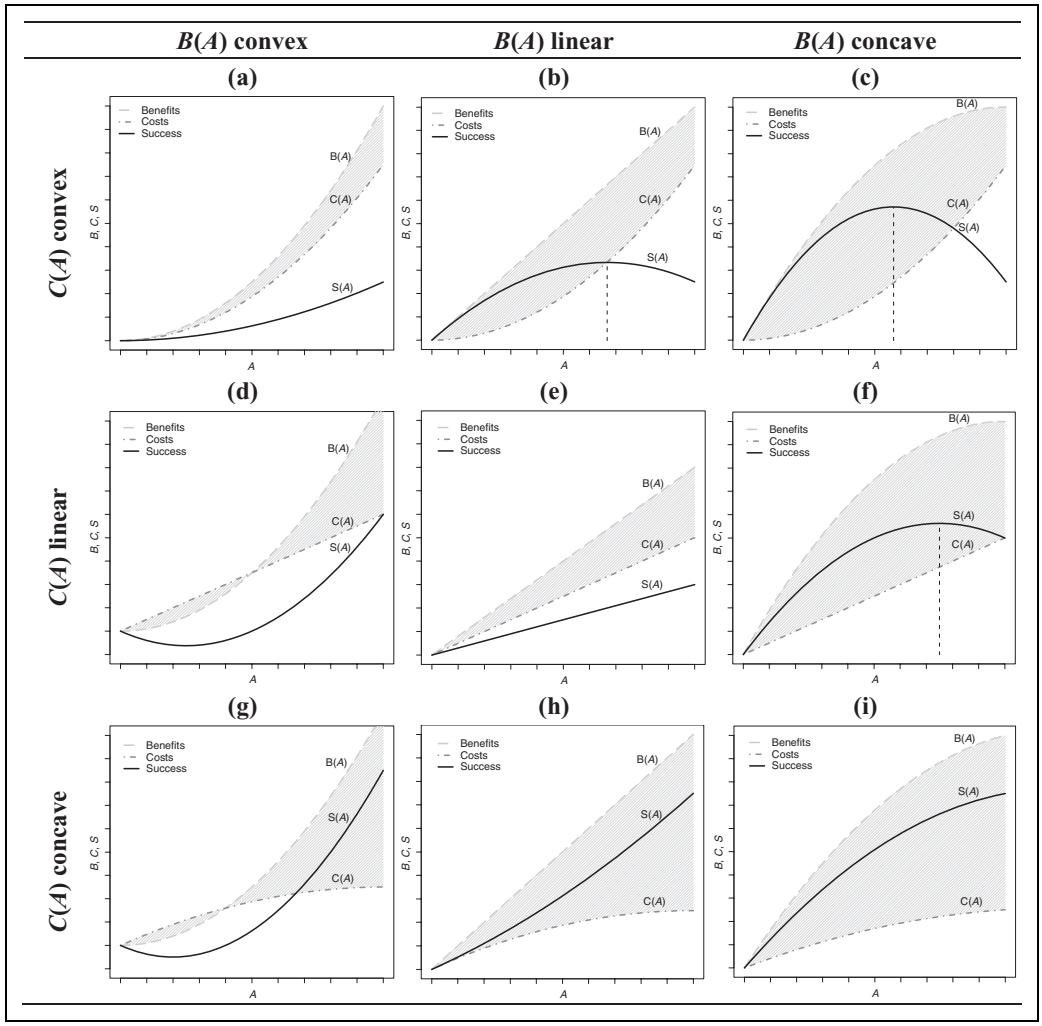


Figure 2. Combinations of benefits and costs.
Note: Figure 2f is identical to Figure 1.

Even in studies that consider benefits and costs jointly, it is not necessary that the TMGT effect appears. In our conceptual framework, the TMGT effect becomes visible in the success function $S(A)$ and occurs when this function features a local maximum; thus, it has an inverse U-shape. As illustrated in the individual panels in Figure 2, the TMGT effect occurs in combinations b, c, and f. In contrast, combinations a, e, h, and i do not exhibit a TMGT effect because the $S(A)$ function monotonically increases in A. The remaining combinations d and g also feature an extreme value of the $S(A)$ function; however, this extremum is actually a minimum because between the two intercept points of the cost and benefit functions, the costs are greater than the benefits. In sum, the ABC framework accommodates the TMGT effect but also indicates situations in which it is absent.

The Cases in the ABC Framework

This section further juxtaposes the nine benefit and cost combinations of the proposed ABC framework (hereafter referred to as cases a to i, in resemblance of Figures 2a to 2i). The nine cases are

expounded on in Table 1. Therein, we depict one example for each case, discuss whether the TMGT effect can occur, and consider whether curvilinearity should be addressed in the respective case.

With respect to the TMGT effect, we conclude that cases a, b, c, f, and i can but are not required to feature it. Whether or not the TMGT effect appears in these cases depends on the forms of the benefit and cost functions, as we explain in depth in Table 1. On the other hand, cases d, e, g, and h cannot feature the TMGT effect. This finding underscores that the TMGT effect is not omnipresent within studies that predict a success-type dependent variable.

The previous section already highlighted that curvilinearity needs to be considered in situations in which the TMGT effect is likely. However, this does *not* mean that an analysis of curvilinearity is *not* important when the TMGT effect is absent. On the contrary, our juxtaposition of the nine cases highlights that in eight of the nine cases, it is at least recommendable to consider curvilinearity because this feature of a relationship allows for the generation of deeper theoretical insights.[3] First, only by applying a curvilinear model can one assess *how much* the dependent variable changes given a certain *level* of the antecedent. Thus, the application of a curvilinear specification facilitates important practical implications. Second, one can only be reasonably assured of the absence of curvilinearity once it has been probed. Finally, some good examples exist in which curvilinear models facilitate important insights, even in the absence of the TMGT effect. Specifically, panels d and g in Figure 2 and the respective examples in Table 1 reveal very interesting dynamics because of the convex shapes of the success functions.

Applying the ABC Framework to the TMGT Effect

The TMGT effect permeates numerous research domains, such as organizational behavior, human resource management, entrepreneurship, and strategic management (Pierce & Aguinis, 2013). In each of those domains, Pierce and Aguinis (2013) identified multiple examples portraying the TMGT effect. It is reasonable to assume that the TMGT effect also occurs in other fields of business research, such as accounting, innovation management, international management, marketing, and operations management, and other social sciences, such as politics, psychology and sociology.

We reconsidered all of the examples that Pierce and Aguinis (2013) discussed from the perspective of the ABC framework, amending some additional literature, and found that the ABC framework explains each of the examples, as discussed in depth in Table 2. Moreover, we have found variants of the cost-benefit reasoning in some prior works (Ames & Flynn, 2007; Grant & Schwartz, 2011; Palich, Cardinal, & Miller, 2000), thus presenting additional support to the validity of extending and formalizing this reasoning by means of the ABC framework.

The remainder of this section extends the analysis of the TMGT effect and of the related implications provided by Pierce and Aguinis (2013). It is important to note that they distinguished two variants of the TMGT effect, one in which the relation between antecedent and dependent variable turns negative for high values of the antecedent and another in which this relation asymptotically approaches a certain value. Only the former matches our conception of the TMGT effect. From the perspective of the developed ABC framework, it is stringent to reserve the term *too-much-of-a-good-thing effect* for situations where detrimental consequences for the success variable arise from increasing the antecedent variable. Otherwise, there would not be "too" much of the good thing (more specifically: too much of the antecedent) in practice, and most of the methodological issues discussed in the following sections would vanish. For this reason, it is purposeful to define the TMGT effect as follows: The TMGT effect denotes situations in which an initially positive relation between an antecedent and a desirable outcome variable turns negative when the underlying ordinarily beneficial antecedent is taken too far, such that the overall relation becomes nonmonotonic.

Pierce and Aguinis (2013) recommended that "future theory development efforts should predict not only whether X will be related to Y but also the precise points on the X continuum where"

Table 1. Cases in the Antecedent, Benefit, Cost (ABC) Framework.

		B(*A*) convex (a)	*B*(*A*) linear (b)	*B*(*A*) concave (c)
C(*A*) convex	Theoretical example	• *A*: Number of users of a social network • *B*, *C*: Benefits and costs these users provide to the social network and its provider • *S*: Financial success of the social network provider • *B*(*A*): Network effect causes convex benefits to the users which lead to convex benefits for the social network provider because its service becomes relatively more valuable • *C*(*A*): At moderate numbers of users, the incremental costs of adding users are mostly driven by technology and are overall negligible. Later users will be relatively more expensive to attract than earlier ones since people's affinity to social networks varies	• *A*: Organizational tenure diversity • *B*: Skills and knowledge within the team • *C*: Team members do not "speak the same language" anymore; a "lack of common frame of reference" (Chi et al., 2009, p. 702) becomes visible • *S*: Team innovation • *B*(A): Chi et al. (2009) do not identify any nonlinearity here • *C*(*A*): The costs may increase more than linearly because "teams with extremely diverse members may be prevented from capitalizing on the benefits of tenure diversity because of disagreements" (Chi et al., 2009, p. 714)	• *A*: Amount of organizational slack (unallocated excess resources, e.g. Bourgeois, 1981) • *B*: Exploitation of opportunities; endurance of downturns (Cyert & James, 1963) • *C*: Opportunity costs of unused resources and emerging dysfunctional behaviors • *S*: Firm performance • *B*(*A*): Marginally decreasing; once the slack is sufficiently large to allow a firm to deal with economic fluctuations, the additional value of further increasing slack is negligible • *C*(*A*): Opportunity costs rise linearly with the amount of slack; increasingly inefficient resource allocation and self-serving activities of managers (Jensen, 1986) may create convexity
	TMGT effect	• **TMGT effect is possible, but not certain** • Figure 2a does *not* feature the TMGT effect, because *B*(*A*) > *C*(*A*) for all values of the performance antecedent • However, the TMGT effect *would* occur if *C*(*A*) rose less strongly than *B*(*A*) at low values of *A* (e.g., due to an emphasis on information technology costs), but more strongly at higher values of *A* (e.g., due to an emphasis on customer acquisition costs)	• **TMGT effect is very likely, but not certain** • Figure 2b *features* the TMGT effect (visible in the maximum of *S*(*A*)) • The TMGT effect also occurs in the theoretical example: "This relationship is positive as diversity is below the mean but becomes negative when the diversity exceeds the mean" (Chi et al, 2009, p. 703) • The TMGT effect would *not* occur if there existed no *A* for which *B*(*A*) > *C*(*A*) (e.g., imagine the benefit function in Figure 2b to be turned clockwise around the origin until this happens) • Without being aware of any *A* for which *S*(*A*) > 0, scholars might not conduct the study; in that pragmatic sense, the TMGT effect is "very likely"	• **TMGT effect is very likely, but not certain** • Figure 2c *features* the TMGT effect (visible in the maximum of *S*(*A*)) • TMGT effect also occurs in the theoretical example; an inverted U-shaped effect of slack on firm performance has been reported in the literature (e.g., Tan & Peng, 2003) • However, the TMGT effect would *not* occur if, at the origin, the slope of *B*(*A*) was lower than the slope of *C*(*A*) (i.e., $\partial B/\partial A_{A=0} < \partial C/\partial A_{A=0}$) (with $B(A=0) = C(A=0) = 0$). Then *S*(*A*) < 0 for any *A*
	Curvilinearity	• **Attention to curvilinearity is necessary** because of the possible occurrence of the TMGT effect	• **Attention to curvilinearity is necessary** because of the very likely occurrence of the TMGT effect	• **Attention to curvilinearity is necessary** because of the very likely occurrence of the TMGT effect

(continued)

Table 1. (continued)

		B(*A*) convex (d)	*B*(*A*) linear (e)	*B*(*A*) concave (f)
C(*A*) linear	Theoretical example	• *A*: Number of employee identification cards introduced at a firm • *B*: Operational improvements for the firm • *C*: Monetary costs for the firm • *S*: Overall performance of the program • *B*(*A*): The benefits will initially be negligible; there is little use in having identification cards for a few employees. The larger the number of employees equipped with cards, the larger is the benefit to the firm. The final employee who gets one provides the maximum incremental benefit • *C*(*A*): Assume that the cards are bought from a third party and the firm does not have enough market power to influence the unit price; the cost function is therefore linear	• *A*: Number of laptops bought for a *homogenous* group of managers at a certain hierarchical level • *B*: Efficiency of managerial work • *C*: Monetary costs of the laptops • *S*: Overall use of the program to the firm (assume the early 2000s) • *B*(*A*): Each laptop allows a manager to work more efficiently so that each laptop provides the *same* benefit • *C*(*A*): Assume that the firm does *not* have sufficient market power to negotiate price reductions for larger quantities; then, the cost function will be linear	• *A*: Conscientiousness (which captures whether a person works hard, is dependable, persevering, and achievement oriented, Le et al., 2011) • *B*: Amount of attention allocated to task-related behavior (Le et al., 2011), as well as thoroughness and careful planning (Barrick, 2005) • *C*: Opportunity costs; highly conscious people invest more time to improve accuracy due to their deliberate and dutiful nature (Le et al., 2011) • *S*: Task performance of low complexity jobs • *B*(*A*): The more refined the current planning, the less beneficial are increases in conscientiousness. • *C*(*A*): If one assumes that conscientiousness has a linear relation with investments of time, then the cost function is linear
	TMGT effect	• **TMGT effect is not possible** • Figure 2d does not feature the TMGT effect because there is no upper limit to the *S* values that can be achieved with a convex *B*(*A*) function and a linear *C*(*A*) function • The case depicted in Figure 2d resembles our theoretical example if, therein, the costs of the identification cards initially surmount the benefits, whereas, later on, the benefits are higher than the costs • However, Figure 2d depicts a success *minimum* which also matches the previously described scenario for the theoretical example	• **TMGT effect is not possible** • Figure 2e does not feature the TMGT effect because $B(A) > C(A)$ for all values of the performance antecedent, due to $\partial B/\partial A > \partial C/\partial A$ • The case depicted in Figure 2e resembles our theoretical example if, therein, the benefit of a laptop is found to be higher than its costs (i.e., $\partial B/\partial A > \partial C/\partial A$). In a case like that, the firm would hence buy laptops for all of its managers • If $\partial B/\partial A < \partial C/\partial A$, then there would be a success maximum of $S(A{=}0) = 0$ (the firm would hence not buy any laptops). However, we reserve the TMGT effect label for cases where $\max(S(A)) > 0$	• **TMGT effect is very likely, but not certain** • Figure 2f *features* the TMGT effect (visible in the maximum of *S*(*A*)) • TMGT effect also occurs in the selected example, as identified by Le et al. (2011) • The combination of a concave *B*(*A*) and a linear *C*(*A*) function may reflect one of the most typical cases that trigger the TMGT effect at the firm level • However, the TMGT effect would *not* occur if the slope of the *C*(*A*) function at the origin was steeper than the slope of the *B*(*A*) function (i.e., $\partial C/\partial A_{A=0} > \partial B/\partial A_{A=0}$ and $B(A{=}0) = C(A{=}0) = 0$)
	Curvilinearity	• **Attention to curvilinearity is recommended** because only a curvilinear specification can identify the dynamic inherent in the *S*(*A*) function, due to $\partial^2 S/dA^2 > 0$ for any *A*	• **Attention to curvilinearity is optional;** if the theory unambiguously predicts linear costs and benefits, a linear specification is sufficient. However, researchers still may want to probe for curvilinearity as a measure of precaution	• **Attention to curvilinearity is necessary** because of the very likely occurrence of the TMGT effect

(continued)

Table 1. (continued)

		$B(A)$ convex (g)	$B(A)$ linear (h)	$B(A)$ concave (i)
$C(A)$ concave	Theoretical example	• A: Network size of the land transportation network of a logistics firm (expressed in area covered, depots, or number of vehicles employed) • B: Revenue potential of the network to the firm • C: Monetary costs of the network to the firm • S: Financial performance of the logistics firm • $B(A)$: Each incremental increase in A will be relatively more beneficial to the firm than the previous one, because the firm can offer a better, more comprehensive service to its customers • $C(A)$: The larger the network is, the higher are the yields that the firm can achieve, which means that the average load factor of its trucks will rise. This leads to decreasing average unit costs, as do increases in market power	• A: Number of laptops bought for a *homogenous* group of managers at a certain hierarchical level • B: Efficiency of managerial work • C: Monetary costs of the laptops • S: Overall use of the program to the firm (assume the early 2000s) • $B(A)$: Each laptop allows a manager to work more efficiently so that each laptop provides the *same* benefit • $C(A)$: Assume that the firm *does* have sufficient market power to negotiate price reductions for larger quantities; then, the cost function will be concave	• A: Number of laptops bought for a *heterogeneous* group of managers at a certain hierarchical level • B: Efficiency of managerial work • C: Monetary costs of the laptops • S: Overall use of the program to the firm (assume the early 2000s) • $B(A)$: Assume that younger managers are able to benefit *more* from having laptops because they have more specific usage knowledge. In this scenario, the benefits would be concave • $C(A)$: Assume that the firm *does* have sufficient market power to negotiate price reductions for larger quantities; then, the cost function will be concave
	TMGT effect	• **TMGT effect is not possible** • Figure 2g does not feature the TMGT effect because there is no upper limit to the S values that can be achieved with a convex $B(A)$ and a concave $C(A)$ function • The theoretical example can also not feature a TMGT effect • However, Figure 2 g depicts a success *minimum*. This minimum could also be observed in our selected example, assuming that at low levels of network size, the costs still surmount the benefits	• **TMGT effect is not possible** • Figure 2h does not feature the TMGT effect because there is no upper limit to the S values that can be achieved with a linear $B(A)$ and a concave $C(A)$ function • The theoretical example can also not feature a TMGT effect • However, it would be possible for this case to produce a success *minimum*. Our selected example would, for example, feature a minimum if at low purchase quantities, the costs still surmount the benefits	• **TMGT effect is possible, but not certain** • Figure 2i does *not* feature the TMGT effect because $B(A) > C(A)$ for all values of the performance antecedent • The combination of a concave $B(A)$ and a concave $C(A)$ function *can*, however, trigger the TMGT effect, for example, if the $C(A)$ function is both more pronouncedly curved (in absolute terms) than the $B(A)$ function and rising more steeply in the origin, assuming also that $B(A{=}0) = C(A{=}0) = 0$
	Curvilinearity	• **Attention to curvilinearity is recommended** because only a curvilinear specification can identify the dynamic inherent in the $S(A)$ function, due to $\partial^2 S/dA^2 > 0$ for any A	• **Attention to curvilinearity is recommended** because only a curvilinear specification can identify a possible success minimum, which will likely be theoretically insightful	• **Attention to curvilinearity is necessary** because of the possible occurrence of the TMGT effect

Note: According to our theoretical explanation, we expect $B(A)$ and $C(A)$ to be "well-behaved," strictly monotonic, non-negative functions for positive values of A.

Table 2. Applying the Antecedent-Benefit-Cost (ABC) Framework to Examples of the Too-Much-of-a-Good Thing (TMGT) Effect Throughout Various Domains.

Domain	TMGT Example	Potential Explanation From the Perspective of the ABC Framework
Organizational behavior	Leadership: relationship between assertiveness and effectiveness of leadership (observed by Ames & Flynn, 2007)	• *A*: Assertiveness • *B*: Instrumental outcomes such as goal achievement (Ames & Flynn, 2007) • *C*: Social costs, such as decreasing likeability and friendliness (Ames & Flynn, 2007) • *S*: Perceived leadership effectiveness • Rationale: From a certain level of assertiveness on, social costs become so insufferable that they begin overcompensating additional contributions to goal achievement (Ames & Flynn, 2007), thereby beginning to decrease perceived leadership effectiveness. In accordance with this explanation, Ames and Flynn (2007) observed a "trade-off between social costs and instrumental benefits" (p. 307).
	Conscientiousness: relationship between conscientiousness and task performance for low complexity jobs (observed by Le et al., 2011)	• *A*: Conscientiousness (which captures whether a person is "dependable . . . , hardworking, achievement oriented, and persevering," Pierce & Aguinis, 2013, p. 319) • *B*: Attention allocated to task-related behavior (Le et al., 2011), thoroughness, and careful planning (Barrick, 2005) • *C*: Time allocated to improve accuracy (Le et al., 2011, p. 115) • *S*: Task performance • Rationale: For low complexity jobs, thoroughness and careful planning are less useful than for high complexity costs. For these tasks, it is possible that from a certain level of conscientiousness on, too much time is allocated to improving accuracy, such that the overall task performance deteriorates.
Human resource management	Enriched job design: relationship between job scope and satisfaction for individuals with high pay and low growth need (observed by Champoux, 1992)	• *A*: Job scope • *B*: Autonomy and meaning (Champoux, 1992) • *C*: Perceived complexity, levels of mental demand, stress from high responsibility (Champoux, 1992; Xie & Johns, 1995) • *S*: Satisfaction • Rationale: For individuals with weak growth need (i.e., a desire for "personal growth and accomplishment at work," Tiegs, Tetrick, & Fried, 1992, p. 576), increasing job scope beyond a certain point may cause more stress than autonomy and meaning, thereby beginning to decrease job satisfaction.
	Experience in personnel selection decisions: relationship between experience and job performance (observed by Sturman, 2003)	• *A*: Temporal experience in personnel selection • *B*: Enhanced abilities, knowledge, and skills (Sturman, 2003) • *C*: Aging effects, such as decreasing flexibility, alertness, and innovativeness • *S*: Job performance • Rationale: Since experience is inherently linked to aging, increases in experience can only improve job performance in personnel selection, as long as incremental ability losses from aging are smaller than incremental knowledge and skill gains from the experience-collection effect. From the moment this is not the case anymore, job performance begins to decrease.

(continued)

Table 2. (continued)

Domain	TMGT Example	Potential Explanation From the Perspective of the ABC Framework
Entrepreneurship	New venture planning: relationship between formal planning of new ventures and firm performance (observed by Chrisman, McMullan, & Hall, 2005)	• *A*: Amount of formal planning • *B*: Understanding of capacities and resources, development of long-term policies (Camillus, 1975) • *C*: Overconfidence and cognitive rigidity (Hayward, Shepherd, & Griffin, 2006) • *S*: Firm performance • Rationale: The benefit function should be concave as the first incremental increases of formal planning should contribute more to the understanding of capacities than subsequent incremental increases. At the same time, overconfidence costs should rise at least linearly (or stronger) with increases of planning, precisely because planners observe the increasing tightness of their business plan. The resulting constellation can plausibly trigger the TMGT effect (Figure 2, Panels c and f).
	Firm growth rate: relationship between firm growth rate and firm performance (observed by Ramezani, Soenen, & Jung, 2002)	• *A*: Firm growth (i.e., "the change in profit-seeking activities per unit time," Pierce & Aguinis, 2013, p. 321) • *B*: Contributions to survival and profitability that are necessary for new ventures (Capon, Farley, & Hoenig, 1990; Eisenhardt and Schoonhoven, 1990) • *C*: High-risk acquisitions or excessive green field investments that ultimately destroy value, questionable earnings management (Fuller & Jensen, 2002) • *S*: Firm performance • Rationale: While moderate levels of firm growth are beneficial for firm survival, it seems that excessively high levels of growth are associated with so much risk taking that the costs overcompensate for the desired effects.
Strategic management	Diversification: relationship between diversification and performance (observed by Qian, Li, Li, & Qian, 2008)	• *A*: Diversification • *B*: Efficiency gains as a result of economies of scope (Helfat & Eisenhardt, 2004) and reduced risk (Kim, Hwang, & Burgers, 1993) • *C*: Cross-subsidization of poorly performing business units, overinvestment, rising transaction costs within a firm because of diversification-induced growth, firm price discounts because shareholders can diversify better than firms (Berger & Ofek, 1995; Brealey & Myers, 2010; Coase, 1937; Martin & Sayrak, 2003; Rajan, Servaes, & Zingales, 2000) • *S*: Firm performance • Rationale: Palich, Cardinal, and Miller (2000) concluded from their own meta-analysis of the diversification-performance relationship: "As it becomes more difficult to share activities and transfer competencies between units, the costs of increased diversification seem to outweigh any potential benefits beyond a certain point of relatedness" (p. 168).

(continued)

Table 2. (continued)

Domain	TMGT Example	Potential Explanation From the Perspective of the ABC Framework
	Organizational slack: relationship between slack and organizational performance (observed by Tan & Peng, 2003)	• *A*: Organizational slack (i.e., unallocated excess resources, Bourgeois, 1981) • *B*: Contribution to the exploitation of opportunities and the endurance of downturns (Cyert & James, 1963) • *C*: Inefficient resource allocation and self-serving activities of managers (Jensen, 1986) • *S*: Firm performance • Rationale: Once again, the changing marginal effects of slack on costs and benefits may explain the inverted U-shaped relation, which has been found in empirical studies (e.g., Tan & Peng, 2003).

Note: The chosen domains and TMGT effect examples are identical with the ones viewed by Pierce and Aguinis (2013). The alternative explanations are plausible from the methodological perspective of the ABC framework, thereby illustrating its usefulness. As such, they are not supposed to substitute in-depth theorizing by experts in the respective domains. *A* = antecedent; *B* = benefits; *C* = costs; *S* = success.

(p. 325) the TMGT effect occurs. Our explanation supports this recommendation and defines the TMGT effect as a situation in which the incremental costs caused by an antecedent variable become larger than the incremental benefits, which creates a success maximum. Furthermore, the ABC framework suggests that the precision of theoretical arguments can be enhanced if the benefits and costs associated with an antecedent are conceptually disaggregated, such that new or refined theories are unambiguously related to benefits (i.e., theories that do not speak about costs), costs, or what we have labeled as success (i.e., theories that consider benefits and costs jointly). In situations in which the scope of existing theories is limited either to benefit or cost aspects, researchers should aim to develop the complementary cost (or benefit) theory to generate a coherent desirable outcome theory. Moreover, efforts geared toward developing or refining theory should always strive to determine the approximate shapes of benefit, cost, and success functions. The previous section illustrated how theorizing linear effects is hardly ever sufficient; therefore, we recommend that the overall curvatures (concave, linear, or convex) of benefit and cost functions are theorized as well. Another suggested amendment is to re-aggregate the shape of benefit and cost functions to an overall success function shape.

Pierce and Aguinis (2013) referred to Aristotle by distinguishing between *actions*, *passions*, and *things good in themselves*. They "expect to find asymptotic relations for predictors that can be classified as being good in themselves (e.g., general mental ability, wisdom) but inverted U-shaped relations between predictors and outcomes for predictors that can be classified as either actions or passions" (p. 326). As our conceptual framework and Figure 2 highlight, a TMGT effect of *actions* and *passions* depends on the shapes of the cost and benefit functions in the respective study. Thus, the question of whether the relation reaches a maximum can only be answered if the research is informed by extant or newly created theory related to both benefits and costs. While the previous section confirmed the concern, as expressed by Pierce and Aguinis (2013), that many investigations with dependent desirable outcome variables would actually require a curvilinear model when linear models are applied, it also showed that the TMGT effect as such is not omnipresent. This leads to the recommendation to conduct a theory-guided analysis of each study under scrutiny with the help of the ABC framework.

Concerning the category of *things good in themselves*, we return to the cited example of general mental ability and wisdom. Keeping in mind that it is key to consider both benefits and costs that

result from antecedent variables, it can be argued that it is more costly for firms to hire people with higher general mental ability and wisdom. Hence, at the firm level, such antecedents are subject to the same benefit and cost trade-offs as are the other two categories (i.e., actions and passions), and they can also exhibit inverse U-shaped effects on firm performance. General mental ability and wisdom might even be taken too far with respect to individual job performance, in which monetary costs play no role. For instance, the human resource management literature found that people with outstanding abilities might become bored more easily by repetitive tasks, which may reduce their performance for these specific tasks (Le et al., 2011). Thus, even things that seem to be good in themselves should be subjected to a cost-benefit analysis along the lines suggested by the ABC framework. If an antecedent variable generated only benefits but no costs, the cost function would be flat (i.e., linear and parallel to the x-axis), whereas the benefit function would not yet be further specified and could thus far match case d, e, or f in the framework in terms of curvature (see Figure 2). Therefore, no intercepts would emerge between cost and benefit functions in addition to the origin, so there could not be any TMGT effect, however the benefit function looked.

Furthermore, Pierce and Aguinis (2013) suggested that researchers consider whether "excessively high levels of a construct may actually constitute a different construct" (p. 327). In other words, something "good" becomes something "bad." According to the perspective of competitive mediation between benefits and costs, such a change of the construct is not necessary. The ABC framework suggests that the antecedent itself is neither good nor bad; rather, it generates both benefits and costs that vary in their marginal effects depending on the value of the antecedent. The cost-benefit perspective may even stimulate further theorizing if unexpected U-shaped relations are found in empirical investigations. For example, Ames and Flynn (2007) empirically found that the relation between assertiveness and social outcomes[4] has a maximum. The ABC framework indicates that this relation can be further disaggregated. It seems that the social outcomes incorporate not only a cost component (representing the undesired effect) but also a benefit component (representing a desired effect), which jointly explain the curvilinear shape of the social outcomes as a function of assertiveness. Thus, it may be worthwhile to investigate the social outcomes in a success-type study that incorporates costs and benefits as mediators between assertiveness and social outcomes. In general, we recommend that researchers who regard their dependent variable to be related only to benefit (or cost) apply this disaggregation whenever they empirically encounter an extreme point (e.g., by analyzing scatterplots, as recommended by Pierce and Aguinis, 2013). Ex ante theorizing based on the framework is even more highly recommended.

The previous discussion has largely unraveled the TMGT effect. However, the framework has important additional uses in desirable outcome contexts, which we portray in the following sections. First, we elaborate on how it can guide theorizing (cf. Edwards & Berry, 2010). Second, the framework has the capacity to inform empirical research that can derive a better understanding of why desirable outcome functions evolve in the manner they do.

Applying the ABC Framework for Theorizing

Most basically, the framework reminds us to consider both benefits and costs as components of success. A separate analysis of these components facilitates theorizing on success, using the three-times-three matrix of the curvatures to ponder the functional form of the success function. Moreover, the framework suggests that scholars do not have to be content with existing theory but can generate theory on the forms of success functions in a rather straightforward manner by integrating the functional forms of—possibly multiple—benefit and cost functions. For example, consider a situation in which extant theory predicts that the benefit function is concave such that it monotonically increases in the antecedent variable and features decreasing marginal returns to it. Furthermore, suppose that researchers have good conceptual arguments as to why they regard the cost function as linear.

Having considered the curvatures of both benefit and cost functions, the researchers can consult the theoretical framework and identify this situation as the one depicted in Figures 1f and 2f.

The cost-benefit duality can also facilitate the interpretation of empirical results. For example, the empirical results of Chi, Huang, and Lin (2009) demonstrated a sharp decline of team innovation for high values of diversity. While this effect could result from extremely increasing costs, as Chi et al. (2009) suspected, it could also be taken as a hint to explore additional drivers of the nonlinear effect. For instance, a marginally decreasing benefit function, as depicted in Figure 2c, would suggest a stronger curvature than would the linear benefit function depicted in Figure 2b (holding the cost function constant). In other words, although Chi et al. (2009) emphasized the potentially increasing costs of diversity as an explanation for the TMGT effect, this effect could alternatively, or additionally, be driven by marginally decreasing benefits. Thus, the framework can help further refine the underlying theory post hoc.

In many desirable outcome studies, contextual factors (i.e., moderators) can influence the relations between antecedents and outcomes. Therefore, it is important to highlight that the framework can accommodate these moderators and facilitate theorizing with them. Moderators have the capacity to influence benefit and cost functions and also, consequently, success functions in multiple ways. Most importantly, they can shift the success function from one case depicted in the conceptual framework to another, and they can provoke or prevent the TMGT effect. For example, assume that our base case is the case depicted in Figure 2e in which both benefits and costs rise linearly with increases in the antecedent. A moderator of the benefit function could shift the shape to Figure 2d or Figure 2f if it were set too high or low, while a moderator of the cost function could cause a shift to Figure 2b or Figure 2h. If both functions were moderated simultaneously, the shift could occur to every case in the three-times-three matrix. For example, Chi et al. (2009) suggested that team-oriented HR practices could reduce communication problems between diverse team members. From the perspective of our framework, this finding implies that the cost function is contingent on team-oriented HR practices. For intensive use of the HR practices, the curvature of the cost function becomes less pronounced, and the relations are shifted from Figure 2b toward Figure 2e. Indeed, the TMGT effect occurs only in the case of a high level of team-oriented HR practices, as depicted by a local maximum of team innovation at medium levels of tenure diversity (Chi et al., 2009). In contrast, the TMGT effect disappears in the case of a low level of team-oriented HR practices, when team innovation monotonically falls in tenure diversity. In other words, the moderator variable represents boundary conditions for the existence of the TMGT effect.

As another example for integrating moderators into ABC-framework-guided theorizing, consider Zhou, Shin, Brass, Choi, and Zhang (2009), who analyzed how the number of weak ties in a social network is related to individuals' creativity. They found a TMGT effect for individuals with low conformity but a linear positive relation for individuals with high conformity. In terms of our framework, benefits from weak ties could be identified with information and new perspectives provided by others, whereas costs would stem from required attention and time. For individuals with low conformity, the costs appear to be so high when large numbers of weak ties are present that further increasing the number of weak ties leaves too little time and attention for each tie; consequently, it becomes more difficult to make sense of the information and translate it into new ideas. Because this TMGT effect is not visible for individuals with high conformity, it appears contingent on a moderator variable once more. Individuals with high conformity are less receptive to new information that contradicts existing norms (Zhou et al., 2009). Viewed through the lens of the ABC framework, their benefit function would increase less with rising numbers of ties than would the benefit function of individuals with low conformity. However, they would also be less prone to becoming overwhelmed by too much information from a large number of weak ties. Thus, also the curvature of their cost function would be less pronounced. Taken together, the results of Zhou et al. (2009) also indicate a boundary condition for the TMGT effect.

The framework suggests that empirically observed shapes of a success function can be explained theoretically by both the benefit and cost functions. The panels in Figure 2 allow us to distinguish between changes in the benefit and cost functions. For example, returning to Chi et al. (2009), while the authors provided sound arguments for the moderation effect of team-oriented HR practices on costs, the conceptual framework suggests that the observed success function could also be (partially) explained by the effects of HR practices on benefits. Thus, the framework facilitates alternative (or additional) explanations for the empirical findings upon which future research could expound. In the following section, we suggest an empirical research design that is capable of detecting these differences.

Applying the ABC Framework in Empirical Studies

A key implication of the competitive mediation–inspired ABC framework is that decomposing the effects of antecedents into benefits and costs allows for the generation of deeper theoretical insights. In this section, we draw on the works of Hayes and Preacher (2010), Hayes (2013), and Zhao et al. (2010) to discuss how the proposed framework can be applied in empirical studies.

In accordance with the ABC framework, the cost-benefit duality can be considered a special case of the concept of competitive mediation in which a dependent variable is affected by two (or more) mediators whose effects point in opposite directions (Zhao et al., 2010). As per this mediation perspective, the *total effect* of the antecedent A on the dependent success variable S is the result of *two competing indirect effects*: A positive indirect effect via a benefit variable B (path $A \rightarrow B \rightarrow S$) and a negative indirect effect via a cost variable C (path $A \rightarrow C \rightarrow S$). In research practice, it is advisable also to model and estimate the *direct effect* of the antecedent on the success variable (path $A \rightarrow S$) because the direct effect may capture the omitted additional benefit- or cost-type mediators (Zhao et al., 2010) and therefore offers heuristic value for further development of the desirable outcome theory at hand. The possible presence of curvilinear relationships between the antecedent and the benefit- and cost-type mediators can be modeled by not only specifying a linear term for the antecedent ($A_{\text{lin}} \equiv A$) but also an appropriate curvilinear term (A_{curv}) derived as a function of A. The standard approach is to use a quadratic function, $A_{\text{curv}} = f(A) = A^2$, leading to higher-order polynomial effects. The corresponding setting is diagrammed in Figure 3.

In some situations, data might only be available for the benefit *or* the cost variable. In such cases, the model shown would be reduced to a single mediator model in which the direct effects of A_{lin} and A_{curv} on S would capture the effect of the omitted benefit or cost mediator. A specification of such a single-mediator model with a nonlinear effect and a procedure to assess and quantify the indirect path can be found in Hayes and Preacher (2010, p. 638). To assess the presence of the TMGT effect and quantify the indirect effects in the model shown in Figure 3, we extend the approach suggested by Hayes and Preacher (2010) as we will illustrate in the following. Given the appropriate data for A, B, C, and S, the model coefficients can be obtained by simultaneously estimating the following equations with a maximum likelihood method or separately with ordinary least squares (OLS) regression:[5]

$$B = i_B + a_{\text{lin},B}A_{\text{lin}} + a_{\text{curv},B}A_{\text{curv}} + e_B \tag{1}$$

$$C = i_C + a_{\text{lin},C}A_{\text{lin}} + a_{\text{curv},C}A_{\text{curv}} + e_C \tag{2}$$

$$S = i_S + bB + cC + a_{\text{lin},S}A_{\text{lin}} + a_{\text{curv},S}A_{\text{curv}} + e_S \tag{3}$$

The TMGT effect emerges if S takes a maximum over the range of A. Detecting this maximum requires an analysis of the total effect of A on S and, more specifically, its marginal rate of change. Staying within the mediation framework and without making any assumptions about A_{curv}, the rate of change in S produced by marginal changes in A is expressed by the first derivative of the function

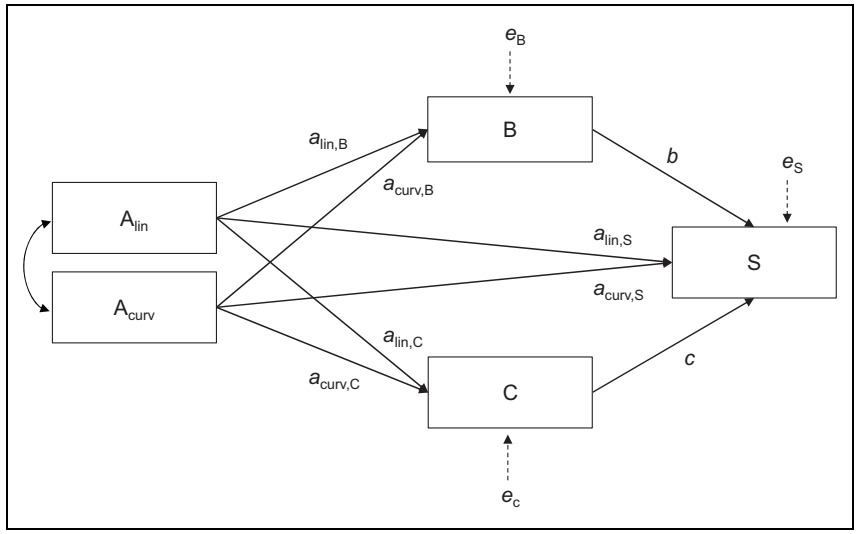


Figure 3. Example for an empirical study guided by the antecedent-benefit-cost (ABC) framework.
Note: Adapted from Hayes and Preacher (2010, p. 638). A_{lin} = linear term of the antecedent; A_{curv} = curvilinear term of the antecedent (e.g., squared term); B = benefit mediator; C = cost mediator; S = dependent success variable; $a_{lin,A}$, $a_{lin,B}$, $a_{lin,C}$ = path coefficients for the linear antecedent term; $a_{curv,A}$, $a_{curv,B}$, $a_{curv,C}$ = path coefficients for the curvilinear antecedent term; e_B, e_C, e_S = error terms.

of S with respect to A. Since S is a composite function of A (Equations 1 and 2) and as a result of the application of the chain rule from calculus to Equation 3, we find:

$$\theta_{total} = \underbrace{\left(\frac{\partial S}{\partial B}\right)\left(\frac{\partial B}{\partial A}\right)}_{\theta_{indirect,B}} + \underbrace{\left(\frac{\partial S}{\partial C}\right)\left(\frac{\partial C}{\partial A}\right)}_{\theta_{indirect,C}} + \underbrace{\left(\frac{\partial S}{\partial A}\right)}_{\theta_{direct}} \tag{4}$$

Thus, the marginal rate of change of the total effect with respect to A is equal to the sum of the first derivatives of the two indirect effects ($A \rightarrow B \rightarrow S$ and $A \rightarrow C \rightarrow S$) and of the direct effect ($A \rightarrow S$). To describe these three derivatives, Hayes and Preacher (2010) suggested the term *instantaneous effect* (denoted as θ). For example, $\theta_{indirect,\ B}$ is the *instantaneous indirect effect of A on S through B*, and it quantifies the change in S through B as A is changing. In a linear setup ($A_{curv} = 0$), each of the instantaneous effects will be constant; otherwise, they will be functions of A.

Equation 4 is helpful to assess the presence of the TMGT effect and quantify the role of the cost and benefit mediators. To illustrate our purposes, we conducted a simple simulation study based on case c (concave benefits and convex costs; see Table 1c) and the commonly used quadratic approach for the curvilinear term (i.e., $A_{lin} \equiv A$; $A_{curv} \equiv A^2$). The specification details, results, and a corresponding scatterplot are reported in Table 3. Given the quadratic specification and Equations 1 to 3, Equation 4 can be expressed as follows:

$$\theta_{total} = \underbrace{b\left(a_{lin,B} + 2a_{curv,B}A\right)}_{\theta_{indirect,B}} + \underbrace{c\left(a_{lin,C} + 2a_{curv,C}A\right)}_{\theta_{indirect,C}} + \underbrace{a_{lin,S} + 2a_{curv,S}A}_{\theta_{direct}} \tag{5}$$

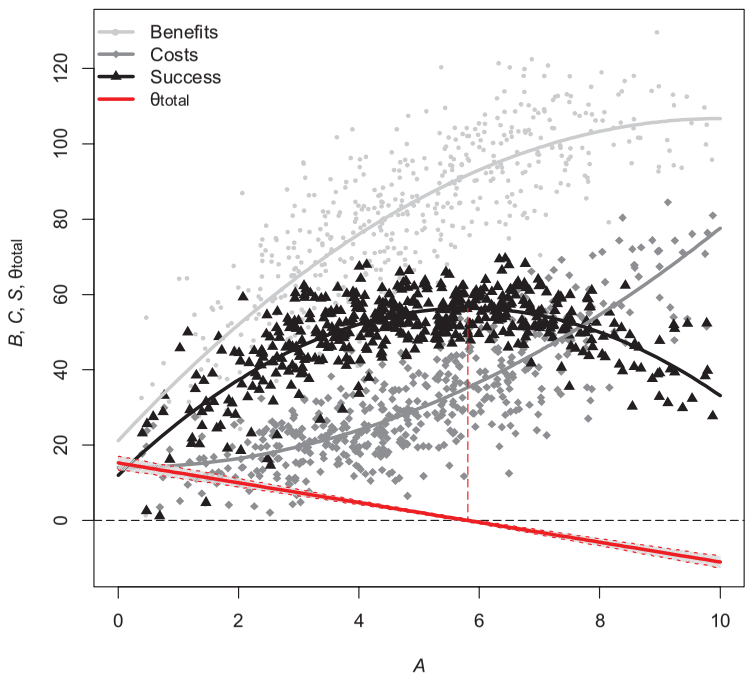
$$= a_{lin,B}b + a_{lin,C}c + a_{lin,S} + 2\left(a_{curv,B}b + a_{curv,C}c + a_{curv,S}\right)A \tag{6}$$

The algebraic rearrangement in Equation 6 highlights that θ_{total} is not constant but is a linear function of A. For this reason and to assess the presence of the TMGT effect, θ_{total} has to be

Table 3. Results of Mediation Simulation Study.

Coefficients		Estimate	*SE*	
$a_{lin,B}$	$(A \rightarrow B)$	17.13	(1.32)	***
$a_{curv,B}$	$(A^2 \rightarrow B)$	–0.86	(0.12)	***
$a_{lin,C}$	$(A \rightarrow C)$	–0.08	(0.84)	
$a_{curv,C}$	$(A^2 \rightarrow C)$	0.64	(0.09)	***
b	$(B \rightarrow S)$	0.48	(0.02)	***
c	$(C \rightarrow S)$	–0.43	(0.02)	***
$a_{lin,S}$	$(A \rightarrow S)$	7.00	(0.57)	***
$a_{curv,S}$	$(A^2 \rightarrow S)$	–0.63	(0.05)	***
$\theta_{\mathbf{indirect,B}}$	$A = 2.0$ (low)	6.59	(0.53)	***
$(A \rightarrow B \rightarrow S)$	$A = 5.0$ (mean)	4.11	(0.24)	***
	$A = 8.0$ (high)	1.64	(0.32)	***
$\theta_{\mathbf{indirect,C}}$	$A = 2.0$ (low)	–1.08	(0.25)	***
$(A \rightarrow C \rightarrow S)$	$A = 5.0$ (mean)	–2.74	(0.17)	***
	$A = 8.0$ (high)	–4.39	(0.31)	***
$\theta_{\mathbf{direct}}$	$A = 2.0$ (low)	4.46	(0.37)	***
$(A \rightarrow S)$	$A = 5.0$ (mean)	0.70	(0.20)	***
	$A = 8.0$ (high)	–3.04	(0.37)	***
$\theta_{\mathbf{total}}$	$A = 2.0$ (low)	9.97	(0.58)	***
	$A = 5.0$ (mean)	2.06	(0.19)	***
	$A = 8.0$ (high)	–5.79	(0.47)	***

Scatterplot With Predicted Values and θ_{total}



Note: Results pertain to a simulation study of the mediation model shown in Figure 3 with $A_{lin} \equiv A$ and $A_{curv} \equiv A^2$. Based on case c (see Figure 2c), the variables *A*, *B*, *C*, and *S* were generated as follows: *A* was randomly drawn from a truncated normal distribution ($\mu = 5$, $\sigma = 2$) with support in [0, 10] ($n = 500$). The true population relationships between *A* and *B*, *C*, and *S* are assumed to be $B = 10 + 20A - A^2$, $C = 10 + 0.75A^2$, $S = B - C = 20A - 1.75A^2$. The TMGT effect occurs at $S(A^* = 5.71) = 57.14$. To the standardized values of all variables, random measurement errors were added (drawn from $N_4[\mu = \mathbf{0}, \Sigma]$ with $\text{diag}[\Sigma] = 1$). For the model coefficients, maximum likelihood estimates with bootstrapped standard errors (*SE*) are shown. The instantaneous effects were estimated at low ($M - 1.5\ SD$), mean (M), and high ($M + 1.5\ SD$) values of *A* by extending the approach suggested by Hayes and Preacher (2010) (with bootstrapped *SE*s). All calculations were performed in *lavaan* (Rosseel, 2012). *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$ (two-tailed).

scrutinized at several specific values of A. Table 3 shows the estimated instantaneous effects at low ($M - 1.5\ SD$), medium (M), and high ($M + 1.5\ SD$) values of A. Given the quadratic specification and the observation that the instantaneous total effect of A on S (θ_{total}) changes its sign from positive at low values to negative at high values, we can infer that the TMGT effect exists within the range of A. Of course, this result follows visually from the scatterplot. However, the presented mediation framework and equations also provide the capability to assess the role of the cost and benefit mediators. As expected from case c, the estimates for $\theta_{indirect,\ B}$ reveal that the $A \rightarrow B \rightarrow S$ path becomes weaker with increasing values of A, while the estimates for $\theta_{indirect,\ C}$ show that the $A \rightarrow C \rightarrow S$ path becomes stronger with increasing values of A.

As illustrated in the previous section and according to examples e, h, and i in Table 1, the benefit and cost effects can also be contingent on other variables. This aspect can be incorporated in the mediation framework by adding moderator variables (Hayes, 2013, p. 446). The resulting specification is called moderated mediation (Iacobucci, Saldanha, & Deng, 2007) and can be conducted in a similar manner to that suggested previously.

Discussion

The ABC framework developed and applied in this article clarifies important conceptual and data analysis issues surrounding the TMGT effect. The purpose of this discussion is to highlight some additional, mostly methodological, issues with respect to the applicability of the ABC framework, thereby also suggesting important paths for future research.

In many studies, scholars have tested curvilinear success relations and found the curvilinear terms to be nonsignificant. For instance, Robie and Ryan (1999) tested the quadratic and cubic effects between conscientiousness and job performance using five samples and found only the linear terms to be significantly different from zero. Our framework suggests that such purely linear effects on a success-type variable exist only when both the underlying benefits and costs are linear, as in case e in Figure 2. In the other cases, however, the true curvilinear relationships described by the ABC framework may be difficult to discover empirically, partly due to a lack of statistical power and low effect sizes. As illustrated in the previous section, curvilinear effects are commonly specified as higher-order polynomial effects (Aiken & West, 1991; LeBreton, Tonidandel, & Krasikova, 2013), which are often smaller than the "main" effects and thus require research designs with high statistical power to be detectable (LeBreton et al., 2013; McClelland & Judd, 1993). Hence, even if a specific desirable outcome theory as per our ABC framework suggests the presence of a curvilinear relationship, field researchers might only identify linear effects because the curvilinear effects are too small to become significant. For example, Whetzel, McDaniel, Yost, and Kim (2010) investigated the relation between 23 occupational personality questionnaire scales and performance and concluded that "few scales exhibited nonlinearity and the magnitude of the departures from linearity were small" (p. 310). This empirical challenge should be considered in a priori power studies in order to determine the sample size needed to attain a sufficiently high probability of detecting the theoretically suggested curvilinear effects.

Moreover, even if the results are nonsignificant, researchers should be attentive to small curvilinear effects. Indeed, prior research has argued that in some research contexts, small effect sizes can be substantially meaningful (Cortina & Landis, 2009; LeBreton, Hargis, Griepentrog, Oswald, & Ployhart, 2007). In desirable outcome studies, small and nonsignificant curvilinear effect sizes could be indicative of a TMGT effect that occurs outside the observed data range, due to limited-range sampling (Grant & Schwartz, 2011). Hence, such a small and seemingly negligible effect could depict an interesting opportunity for future research and should not be dismissed quickly.

The ABC framework also raises some concerns regarding the common practice of analyzing curvilinearity in the context of desirable outcome studies. The common strategy for identifying curvilinearity in regression-based analyses is the "build-up procedure" (Cohen, Cohen, West, & Aiken, 2003, p. 210), which starts from a lower-order (typically linear) model and then introduces the higher-order (e.g., quadratic) term in a second step while focusing on incremental changes in R^2 (LeBreton et al., 2013). In doing so, explained variance (i.e., explanatory power) is first of all assigned to lower-order effects and only subsequently to higher-order effects (for a discussion, see LeBreton et al., 2013). However, in TMGT effect-triggering contexts, the overall curvilinearity of the relationship is suggested a priori by the underlying theory, which means that the theory does not give any priority to either the linear or the curvilinear component of the total effect. To date, "there is no statistical technique that can substitute for good thinking," especially when dealing with nonlinear effects in complex multiple regression models (Aguinis, 2004, p. 131). The ABC framework thus underscores the need for intensifying methodological research on the allocation of explanatory power to higher- and lower-level effects (LeBreton et al., 2013).

Taken together, the combination of the aforementioned issues that may obfuscate the detection and consideration of nonlinear effects and the strong theoretical arguments for nonlinear relations in studies with desirable outcome variables should make researchers cautious to accept linear models. When the data do not (appear to) support the theory, it is of crucial importance that scholars of desirable outcome studies discuss this misfit and try to make sense of it. Many authors seem to ask, *Are there any curvilinear effects that explain variance over and above my linear model?* This question is based on the assumption that a linear model depicts some kind of "parsimonious base case" in empirical research. Scholars then tend to consider the issue as settled if the empirical data do not support curvilinearity. Contrarily, the ABC framework suggests that curvilinear relationships depict the rule in desirable outcome studies rather than the exception. Therefore, in many cases, the right question to ask is, *Why did we not find these curvilinear effects?*

Another specific issue that appears to be important with respect to the empirical applicability and support of the ABC framework is overly high multicollinearity between benefits and costs. When benefits and costs are not only separated in theorizing but actually measured empirically, models might yield unstable results when they are incapable of distinguishing these variables empirically. It seems plausible that other things equal, cases in the ABC framework in which costs and benefits are curved in opposite directions (i.e., the benefit function is convex and the cost function is concave or vice versa) should be relatively more likely to deliver stable models, whereas similar curvatures (e.g., both functions are convex or both functions are concave) might be less likely to deliver stable models. Thus, future research should consider the conditions under which curvilinear effect sizes are substantially important and detectable and which obstructing factors could prevent these effects from becoming visible in empirical research. Statisticians should complement our research in this article by developing additional prescriptions for robust empirical models in accordance with the ABC framework.

Conclusion

This article revisits the too-much-of-a-good-thing effect in management (Pierce & Aguinis, 2013) through the lens of the competitive mediation model (Zhao et al., 2010), with the goal to make it methodologically manageable by explaining it and facilitating its analysis in empirical studies. We find that the TMGT effect can occur frequently in success-type studies (i.e., in studies in which the dependent variable is jointly influenced by benefits and costs). Specifically, it can be observed when incremental benefits outweigh incremental costs at low levels of the antecedent while incremental costs outweigh incremental benefits at high levels of the antecedent.

Researchers who use dependent variables that reflect both benefits and costs have to theoretically analyze or at least consider the functional shapes of both benefits and costs to predict the TMGT effect. To facilitate such an analysis, we propose a three-times-three antecedent-benefit-cost framework that combines convex, linear, and concave benefit functions with the respective curvatures of cost functions. We show how only five of the resulting nine cases in the ABC framework can but are not required to feature the TMGT effect. Contexts that make the TMGT effect particularly likely are those in which the respective benefit functions demonstrate decreasing marginal returns while costs increase linearly or even more than linearly (i.e., convex) with the antecedent.

Having unraveled the TMGT effect, we turn to applications of the ABC framework. First, we show how it can facilitate theorizing related to (un)desirable outcomes. We suggest that these outcomes should generally be further specified as benefit, cost, or success because this distinction increases conceptual clarity and facilitates empirical studies. Moreover, we recommend a bottom-up strategy for success-related theorizing in which the shape of success functions can be synthesized from (multiple) benefit and cost functions while also considering contextual conditions represented by moderators. Second, we suggest disaggregating success into benefits and costs in empirical research to foster a more detailed understanding of what causes the shapes of success functions.

Finally, we illustrate how the conceptual framework can be implemented in empirical studies. The ABC framework depicts a special case of competitive mediation in which a desirable outcome variable is affected by benefit and cost mediators whose effects point in opposite directions. Extending the approach suggested by Hayes and Preacher (2010), the empirical model facilitates assessing the presence of the TMGT effect and quantifying the indirect benefit and cost effects.

While our suggested approach refines the understanding of the TMGT effect and hopefully proves fruitful for future studies, we do not claim that the suggested framework is all encompassing. One can easily construct complicated functional shapes (e.g., piecewise-convex and piecewise-concave functions) that our analysis does not address; however, the underlying cost-benefit logic applies also to such more complicated cases. Moreover, future research could develop more refined competitive mediation models.

We hope that scholars who are in the process of conducting desirable outcome studies will find the numerous prescriptive implications embedded in this article helpful in their quest to conduct rigorous and relevant research.

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Notes

1. Throughout the article, we use the terms *linear* and *linear model* in the sense of "linear-in-variables" models rather than in the sense of "linear-in-parameters" models (Gujarati, 2004, p. 42). This means that the model that we refer to as "linear" is a polynomial of degree one and the dependent variable a simple linear combination of the antecedent(s).

2. Network effects "may be generated through a direct physical effect of the number of purchasers on the quality of the product" (Katz & Shapiro, 1985, p. 424) and exist, for example, in computing, sales, or transportation.
3. This assessment is based on the assumption that researchers are interested in understanding the nature of causal effects (Edwards & Berry, 2010).
4. There were also instrumental outcomes in Ames and Flynn (2007) that reflected benefits only in terms of our framework.
5. Like Hayes and Preacher (2010), we assume that the assumptions for the chosen estimation method are met.

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