Risk-Taking and Goal-Directed Behavior: How decision-making science can inform intentional self-regulation theory

Andrew G. Farina

Tufts University

Author note

Correspondence concerning this article should be addressed to Andrew G. Farina, Eliot-Pearson Department of Child Study and Human Development, Tufts University, Medford, MA 02155. E-mail: [andrew.farina@tufts.edu](mailto:andrew.farina@tufts.edu)

Abstract

[Need to update this field:]

Many consider Intentional Self-Regulation (ISR) or more broadly, goal-directed behavior, to be an important skill in promoting positive and adaptive healthy development across the life-span. The Selection-Optimization-Compensation (SOC) model of ISR has described positive development among children, adolescents, and adults among various populations. Previous studies show the structure of ISR to exist as a global factor within children, and by adulthood, develop into a more defined three factor construct. However, research in adolescents has yet to determine within what ontogenetic window the three-factor construct emerges. In this study, we use a deductive and inductive approach to examine the structure of ISR as explained through the SOC model among cadets at the United States Military Academy.

The study was conducted among 4894 cadets from the 2018-2023 graduating classes. An 11-item, SOC measure was administered to all first year Cadets during Cadet Basic Training. The 3-faced construct validity method was used to compare the results from an exploratory factor analysis with multiple theoretically suggested structures using several confirmatory factor analyses. The findings suggest that ISR, within this context, consists of three differentiated processes. The first process, compensation, is consistent with previous ISR research. The second process, planned execution, is composed of the undifferentiated selection and optimization processes. The third process, persistence, emerges as a third differentiated process within this sample. Future research should continue to explore the developmental trajectories of these three ISR processes and determine the relationship between ISR and important performance outcomes within high performing populations.

*Keywords:* Selection, Optimization, and Compensation; Intentional Self-Regulation; Risk-Taking Propensity; Risk-Taking Appraisal; United States Military Academy

*Word count:* X

Risk-Taking and Goal-Directed Behavior: How decision-making science can inform intentional self-regulation theory

On the darkest of nights, a young military leader was faced with a series of choices that would not only determine if the late-night mission was successful but also if these choices would determine whether the Soldiers under his command could potentially live or die. As the ramp of the cargo aircraft opened, the subzero temperatures filled the cargo area. The Soldiers knew they needed oxygen to breathe at this altitude, and the oxygen bottles strapped to their harnesses were running low. The young leader weighed many goals and factors as he decided whether to make the high altitude jump into enemy territory or have the aircraft turn around and safely return to base. The goals of the mission became increasingly conflicting. On the one hand, the immediate safety of those in the aircraft seemed paramount, but on the other, the safety of the men driving toward the enemy-held compound relied on these airborne Soldiers isolating the compound first. Numerous factors weighed on the decision to execute or abort the mission.

An individual’s goal hierarchy informs priorities and provides a framework for these decisions. If the superordinate goal is mission accomplishment, then the leader may choose to execute the mission even if it is inherently risky for his Soldiers. However, if the lives of his Soldiers are the superordinate goal, then the leader will make decisions and align resources to optimize the health of the Soldiers over the execution of the mission. Given perfect information, this decision could be made based on the established goal hierarchy. Contemporary developmental scientists have sought to describe, explain, and optimize this goal-directed behavior (termed intentional self-regulation) across the life span . A person’s ability to regulate their relationships with their complex and everchanging context is the fundamental basis for successful development across their life (Baltes et al., 1999) . Unfortunately, goal-based decisions are often conflicting due to imperfect information, summarized well by the military idiom, “mission first, men always.”

In the leadership context, leaders often must make goal-based decisions that rely on imperfect and, at times, missing information. Would the oxygen bottles run out before the Soldiers could safely reach the ground? Would the enemy be alerted to the aircraft and train their weapons on the vulnerable Soldiers under parachute? Would the Soldiers be able to land and consolidate on the postage stamp size drop zone in the rugged mountain hills? Did the Soldiers have adequate training to conduct this operation successfully? The outcome of this decision would determine the future professional trajectory of this young leader. These questions all rely on risk-based probabilities that are informed by prior experience, the culture of the organization, the mentorship of experienced Soldiers, and a little bit of luck[[1]](#footnote-21). Decision-making researchers describe this process as *naturalistic decision-making*, in an attempt to capture how individuals use their experience to make decisions (Lipshitz et al., 2001).

This paper will build upon an existing intentional self-regulation theory to incorporate recent advances in the decision-making literature, specifically, the contribution that risk-based probabilities may have on life span goal-directed behavior. I will begin the discussion with the developmental theories of intentional self-regulation, briefly describe the current state of risk-taking research and the decision-making literature, and then turn to a proposed integrated developmental model that better captures naturalistic intentional self-regulation.

# Intentional Self-Regulation

Intentional self-regulation is considered a fundamental process of human functioning (Bowers et al., 2011) and describes a life-span model of behavior that leads to positive outcomes. Intentional self-regulation can be defined as an “individual’s chosen, organized action-in-context that further self-defined, valued goals or purposes” (Napolitano et al., 2011). The construct of goal-related behavior is well described in the German action theory literature (Frese & Zapf, 1994). Action theory is situated within in the developmental systems metatheory describing goal-directed behavior through the lens of a person context relation. That is, neither the person nor the context act independently. Instead, the goal-directed behavior of an individual acts on the context, and the context acts on the individual in a mutually influential manner. Three general models of intentional self-regulation currently exist within the developmental literature (Lerner et al., 2002; see also Gestsdóttir, 2005).

The motivational theory of life-span development builds upon the life-span theory of control and the action phase model of developmental regulation to address the control processes involved in goal engagement and goal disengagement (Heckhausen et al., 2010; Heckhausen & Schulz, 1995). The theory posits two forms of control that exist in goal-directed self-regulation. The primary control process describes the extent to which the individual realizes control over his or her context (Heckhausen et al., 2010). In other words, primary control is the process wherein individuals change the context to bring the context in line with the individual’s goals (Rothbaum et al., 1982). Secondary control is the process by which individuals change themselves to bring themselves in line with the context. Overall, the model describes an individual’s motivational system to maximize primary control across life domains (Heckhausen et al., 2010) through a sequential process of goal selection, goal engagement, and goal disengagement.

The second theory of intentional self-regulation is commonly referred to as the tenacious goal pursuit and flexible goal adjustment (TENFLEX) model (Brandtstädter & Renner, 1990). The TENFLEX model describes the assimilation process as the individual transforming the circumstances to align with personal preferences and the accommodation process as adjusting personal preferences to situational constraints (Brandtstädter & Renner, 1990). According to this model, individuals strive to achieve a subjectively favorable balance of gains and losses across the life span (Brandtstädter, 1989).

The third framework was described by Baltes and Baltes (1990), and involves a theory of life-span development through the Selection Optimization with Compensation Model (SOC). The SOC model was initially theorized to describe a universal life management strategy for successful aging and has been adapted to focus on specific contexts including the workplace (Baltes & Dickson, 2001; Wiese et al., 2000), and child and adolescent development (Gestsdóttir & Lerner, 2007; Lerner et al., 2001). The SOC model is comprised of three processes of developmental regulation. *Selection* refers to setting goals and encompasses the specification of goals, establishing a hierarchy of goals, and a commitment toward goals. A subset of selection is *loss-based selection*, that is, adjusting goals as one ages and resources are no longer available to achieve established goals (such as health) (Freund & Baltes, 2002). *Optimization* refers to the acquisition and investment of goal-related means and encompasses focus, persistence, resource allocation, modeling others, and acquiring new skills (Freund & Baltes, 2002). *Compensation* refers to acquiring alternative means to achieve goals and encompasses substitution of means, enlisting the help of others, activation of unused skills or acquiring new skills, and changes in allocation (Freund & Baltes, 2002).

These three models have significant overlap theoretically (Haase et al., 2013) and generally describe similar processes. [Need to add a paragraph or two explaining this overlap].

The SOC model has been empirically associated with positive outcomes in youth, adolescent, and adult development contexts (Gestsdóttir & Lerner, 2007; Lerner et al., 2002, 2001; Wiese et al., 2000), whereas the other two models have focused on adult development contexts. In the leadership context, the SOC model provides a more useful model because the assimilation and secondary control processes within the previous two models fall short of describing the need for leaders to adapt approaches toward accomplishing established goals and instead focus more specifically on loss-based selection processes or mental processes of acceptance when goals are not achieved. In particular, the military leadership context does not support a leader that fails to accomplish a mission and develops an attitude of “it really wasn’t worth it anyway”, which might be a stance taken when using accomidating processes (secondary control or flexible goal adjustment).

The SOC model does mirror the U.S. Army’s military decision-making process (MDMP). Figure 1 shows the overlap between the two processes. Upon receipt of a mission/goal, the MDMP is meant to objectively weigh and assess different courses of action based on mathematically-based decision criteria to optimize available resources in the accomplishment of the stated mission/goal. Once a plan is established, a process of ‘contingency’ planning is conducted to determine decisions if resources become unavailable (CALL, 2015). This process of goal selection, optimization of resources, and compensation of available means follow the general SOC model of goal-directed behavior.

Both the SOC model and MDMP are objective and do not quantify the probabilistic nature of goal-directed decisions in a context where full information is not available. Risk is the probability of achieving a goal following a decision. The riskier a decision is, the less likely it will be guaranteed that the stated outcome will be achieved. A level of risk underlies every decision that is made in naturalistic settings, as a person does not act in a vacuum but instead acts in an everchanging person ↔ context relation. To better understand how risk can be incorporated into the existing intentional self-regulation theory, it is useful to discuss the current risk-taking literature.

# Risk-Taking

Risk-taking is abundantly mentioned in the neuroscience, decision making science, and risk research fields. A recent meta-analysis in the *Journal of Risk Research* provides a useful description and definition for the four core concepts that exist in risk literature (Bran & Vaidis, 2019). The first is risk-taking behavior, which is the behavioral actions a person takes involving risk. The second is risk-taking propensity, which refers to the degree of the level of a consistent tendency of a person to engage in risk-taking behaviors. The third is risk-taking attitude, which refers to the risk preference or the extent to which a person favors risky choices. The final concept is risk appraisal, which is the subjective assessment of riskiness (Bran & Vaidis, 2019). Whereas risk-taking behavior is an important concept, it does not pertain to the focus of this paper. Instead, I will concentrate the discussion on the latter three concepts.

Empirical studies suggest both a global factor of risk-taking propensity among adolescents (Duell & Steinberg, 2019; Veliz et al., 2015) and a more context specific risk-taking propensity (Horvath & Zuckerman, 1993) among individuals; this contextual specificity suggests that a person may show higher risk-taking propensity in some contexts compared to others. These findings also suggest that risk-taking, as it pertains to intentional self-regulation, may be both global (some individuals are more likely to make riskier decisions) and context specific (some individuals will make riskier decisions in specific contexts). Existing research also suggests increases in risk-taking propensity in high-stress environments (Sicard et al., 2001), following violent combat experiences (Killgore et al., 2008), and with higher levels of perceived self-efficacy (Krueger & Dickson, 1994).

Research on risk-taking attitude is equally conflicting, suggesting that the appeal of risky situations may relate to the management and minimization of the risk involved (Paquette et al., 2009) and not to the riskiness of the situation itself. Attitudes toward risk are most certainly grounded in culture and can be influenced by the context (Crenshaw & Yoder-Wise, 2013). For example, leaders that are willing to expose themselves to potentially life-threatening situations are more effective (Frost et al., 1983) -[Need to find a more recent study showcasing this] and thus would have more favorable attitudes toward risk-taking.

Risk appraisal is perhaps the most interesting concept in the risk-taking literature due to its subjective nature. Risk by its nature is subjective. The same action can be considered risky for one person but safe for another depending on experience, training, and personal situations (Bran & Vaidis, 2019). Skydiving is an excellent example of this subjectivity. If experienced skydivers perceived the same level of risk in this hobby as someone that has never stepped out of an aircraft while it was in flight, skydivers would be less likely (maybe unwilling) to conduct this activity (Bran & Vaidis, 2019). However, the years of training and experience may influence the risk appraisal of the skydivers. Risk appraisal may be an important aspect to consider when thinking about how previous experiences influence an individual’s intentional self-regulation.

The most common model used in the developmental neuroscience field to understand risk-taking is commonly referred to as the duel systems model (Steinberg et al., 2008). This model is predominantly focused on adolescent risk-taking and suggests that increased risk-taking is a result of an imbalance between high reward sensitivity and immature impulse control systems. Through this reductionist lens, both cognitive systems undergo change and maturation during adolescence; however, they mature along prescribed (almost sequential) timetables resulting in an imbalance of these systems and in high levels of risk-taking. This model suggests opposing systems (risk-taking and self-regulation) that are context independent and does little to offer insight into differences in adult risk-taking. As a result, this model is not useful when describing the role of risk-taking in intentional self-regulation. Instead, models from the decision-making research may be more useful to describe risk, goal-setting, goal-adjustment, and context.

# Decision Making

Advances in decision-making research may provide insight into risk-taking and intentional self-regulation. The early models of decision-making, referred to as classical decision-making, involved a deliberate process that required thorough information to choose the best option between all available alternatives, but followed a formal, context-free process (Lipshitz et al., 2001). The MDMP is a concrete example of classical decision-making. When synchronizing hundreds of resources on a battlefield, the MDMP does provide a formal integration and alignment towards common objectives. By following the MDMP, leaders essentially remove their subjective (experienced based) knowledge from the process to conform to the formal process. Practically, aspects of this model are often ignored in favor of the commander’s directed courses of action. The decision-making researchers would refer to this subjective, experience-based approach as a naturalistic decision-making process.

During the 1990s, naturalistic decision-making grew in prominence to capture how contexts influenced decision-making (Orasanu & Connolly, 1993). The naturalistic decision-making model eventually shifted focus from the context in which decisions are made to the way people use their experience to make decisions (Zsambok & Klein, 2014). The shift in focus toward the individual, modeled decision-making as matching the context, and not merely making a context-free choice (Lipshitz et al., 2001).

In naturalistic decision-making research, risk is associated with uncertainty and error. The more uncertainty that exists when making decisions, the higher the probability of making an error. Numerous coping strategies exist to reduce uncertainty; however, the more context-specific experience a decision-maker has, the more ability they have to anticipate problems ahead of time and judge when to continue with a particular plan, or prudently adjust the plan based on their previous experiences (Lipshitz et al., 2001). The naturalistic decision-making research suggests that experience plays a crucial role in decision making under risky/uncertain contexts, and may inform how individuals decide on long-term goals and resource allocation, which is abundant in uncertainty.

# Naturalistic Intentional Self-Regulation

As a developmental construct, intentional self-regulation provides a potentially universal process that informs a person’s goal-directed behavior throughout their life span. However, the specificity principle suggests that developmental scientists should consider that specific people make specific decisions about specific goals in specific contexts for specific reasons (Bornstein, 2019). The current SOC model represents a more *classical* goal-directed behavior model. However, in naturalistic settings, the universality of the SOC process does not specifically consider how an individual assumes, mitigates, and accounts for the inherent risk of making goal-based decisions when information is not complete. In order to understand the potentially idiographic character of a specific person’s intentional self-regulation, an individual’s experience, risk-taking propensity, risk appraisal, and culture must be included.

Consider two similar individuals, each with identical levels of defined and classically-assessed intentional self-regulation. Both individuals adequately select goals, optimize their resources to achieve those goals, and compensate when goal-based means are no longer available. Nevertheless, it may be unlikely that both individuals would choose the same goals and align the same resources toward goal accomplishment even in the same specific context. The specificity principle and the idea of naturalistic intentional self-regulation combine to suggest that interindividual differences will be evident. To account for this variation, developmental scientists must also consider each person’s specific history of experiences within this type of context; willingness to assume risk in goal selection, resource allocation, and compensation; and an individual’s appraisal of the uncertainty (risk).

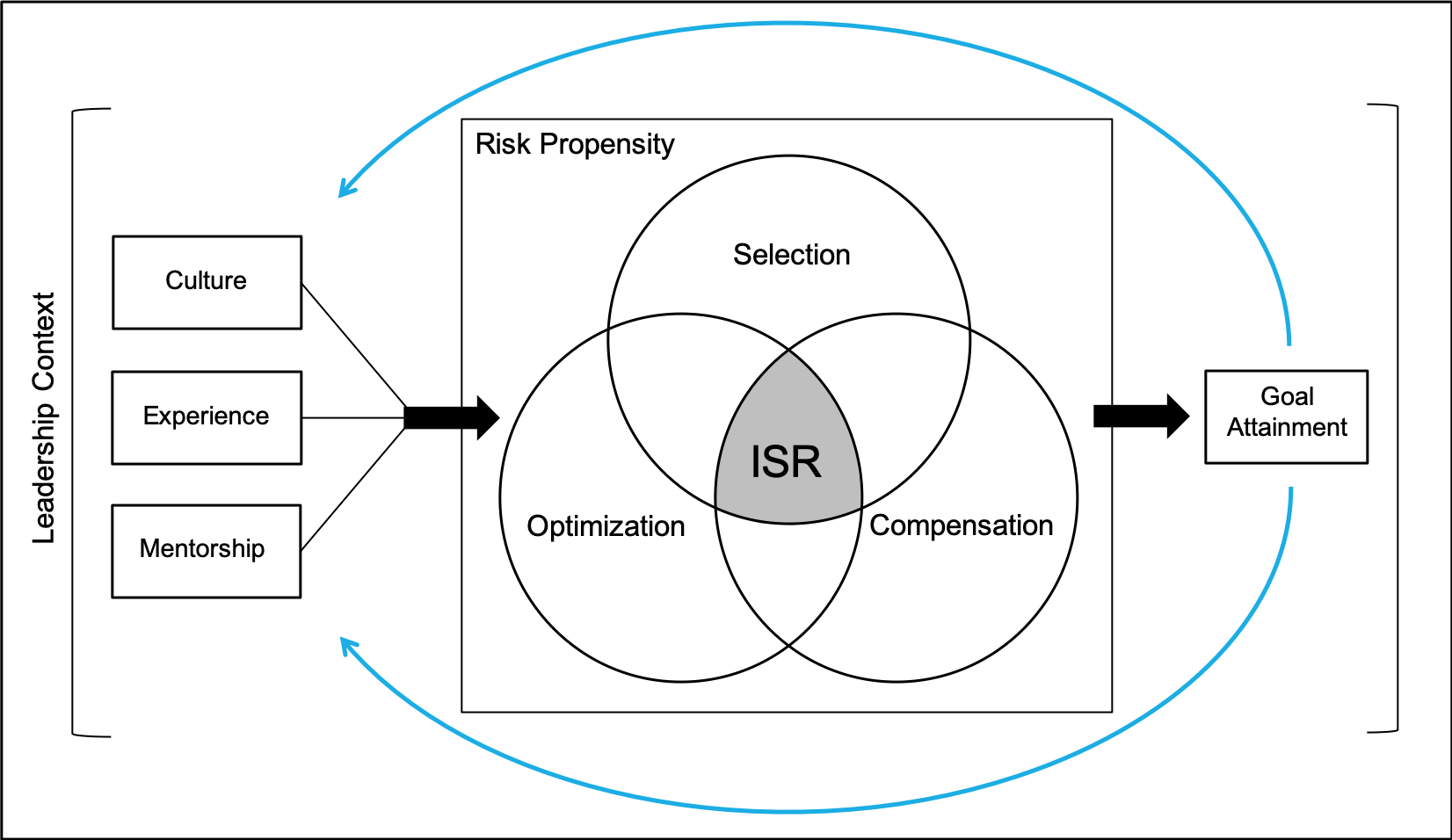
Conceptually, the proposed model, which can be found in Figure 2, begins with a person in context. The goals to establish and how best to optimize available resources would be informed by previous experience, the guidance and advice of mentors, and how resources and mentoring are situated well within the cultural context of the person. These three components provide insight into the individual’s risk-taking (propensity and appraisal), which, in turn, moderates the selection, optimization, and compensation process. The success or failure of the goal-directed behavior would then act in a circular nature to inform future goal-directed behavior. The model clearly depicts the person context relation.

[Insert a discussion about the general features of research that would be needed to test this model, both across and within specific contexts. Discuss how developmental processes might moderate the tests of the model.]

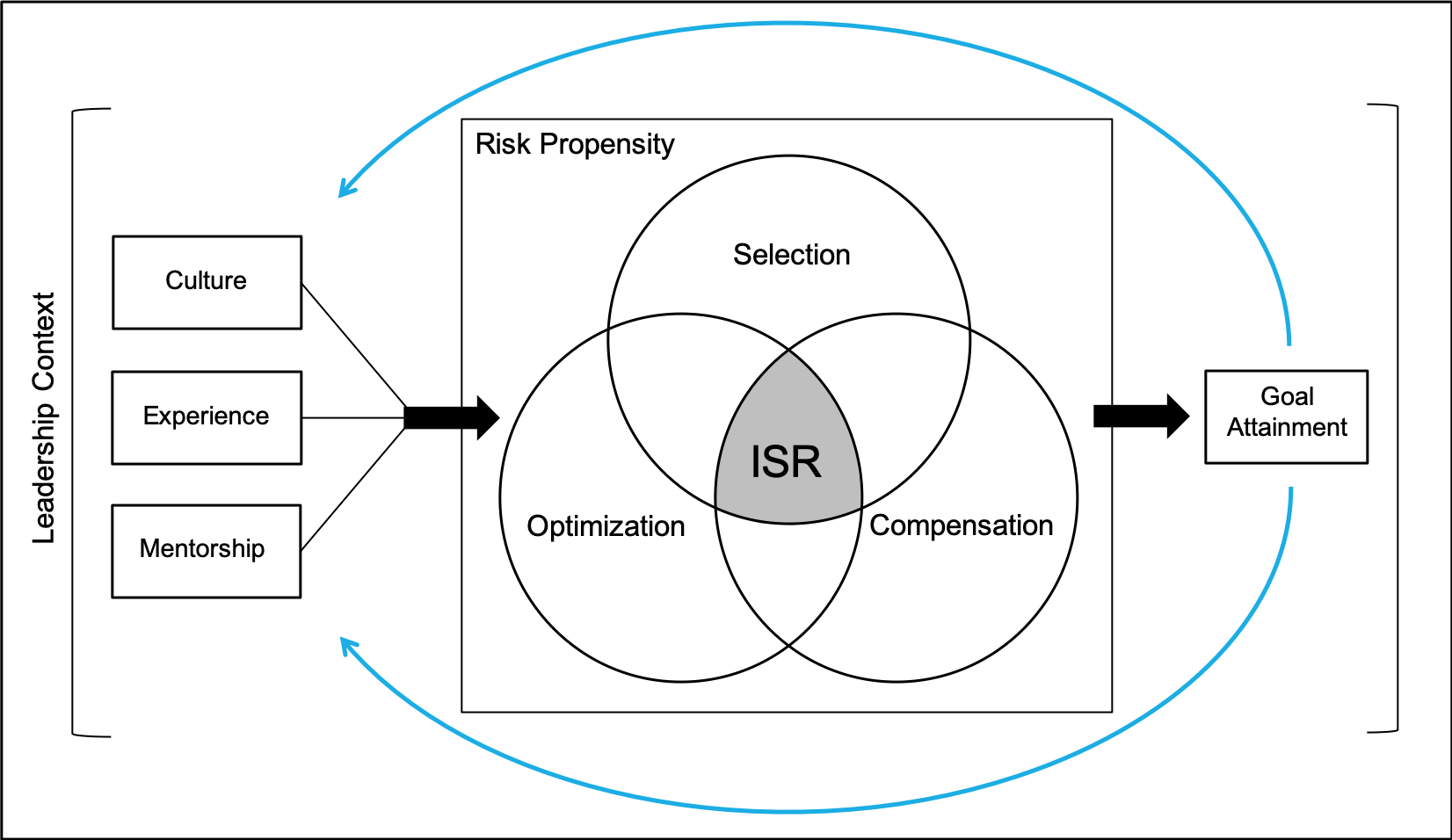
# Conclusions

Several years ago, high above the mountainous landscape, it was the training, experience, council, and culture that informed my goal-directed behavior and decision-making process. After issuing the execution order and watching my well-trained Soldiers disappear into the midnight abyss, I confidently stepped out of the aircraft, one step closer to accomplishing our mission. Now, as a developmental scientist, I am grappling to understand the processes that make some individuals more positively adaptive than others in leadership contexts. I want to understand why I made life-altering decisions throughout my military career so that I can better prepare future leaders to be optimally equipped to make appropriate decisions. The integration of research by developmental scientists, risk-taking scientists, and decision-making scientists provides a lens to understand these processes better. Future research is needed to determine if risk-taking propensity and risk appraisal moderate the positive contributions that intentional self-regulation has on successful adaptation throughout the life-course, and if risk-taking does moderate intentional self-regulation, how can this moderation be optimized throughout life span development.

**Figure 1**

*Comparison of the Military Decision Making Model (MDMP) and the Selection, Optimization, Compensation Model (SOC).*  *Note.* This figure shows a general comparison between these two models.

**Figure 2**

*The Naturalistic Model of Selection Optimization Compensation in a Leadership Context.*  *Note.* While simplistic, this model displays how the context (culture, previous experiences, and guidance/mentorship) influences an individual’s risk-taking propensity and goal-directed behavior, which in turn influences the context in a reciprocal manner.

Adjustments to be made in the word version: - Add Author Note - Bold title on title page - author note- bold and title case the “N”ote - Add wordcount - Create new page after abstract, key words, and wordcount - Bold title on first page - Place figures after references - Make Figure bold - Adjust line spacing for figure and title

# References

Baltes, B. B., & Dickson, M. W. (2001). Using Life-Span Models in Industrial-Organizational Psychology: The Theory of Selective Optimization With Compensation. *Applied Developmental Science*, *5*(1), 51–62. <https://doi.org/10.1207/S1532480XADS0501_5>

Baltes, P. B., & Baltes, M. M. (1990). *Successful Aging: Perspectives from the Behavioral Sciences*. Cambridge University Press.

Baltes, P. B., Staudinger, U. M., & Lindenberger, U. (1999). LIFESPAN PSYCHOLOGY: Theory and Application to Intellectual Functioning. In *Annual Review of Psychology*. http://link.galegroup.com/apps/doc/A54442308/AONE?sid=lms.

Bornstein, M. H. (2019). Fostering optimal development and averting detrimental development: Prescriptions, proscriptions, and specificity. *Applied Developmental Science*, *23*(4), 340–345. <https://doi.org/10.1080/10888691.2017.1421424>

Bowers, E. P., Gestsdóttir, S., Geldhof, G. J., Nikitin, J., von Eye, A., & Lerner, R. M. (2011). Developmental trajectories of intentional self regulation in adolescence: The role of parenting and implications for positive and problematic outcomes among diverse youth. *Journal of Adolescence*, *34*(6), 1193–1206. <https://doi.org/10.1016/j.adolescence.2011.07.006>

Bran, A., & Vaidis, D. (2019). Assessing risk-taking: What to measure and how to measure it. *Journal of Risk Research*. <https://doi.org/10.1080/13669877.2019.1591489>

Brandtstädter, J. (1989). Personal self-regulation of development: Cross-sequential analyses of development-related control beliefs and emotions. *Developmental Psychology*, *25*(1), 96–108. <https://doi.org/10.1037/0012-1649.25.1.96>

Brandtstädter, J., & Renner, G. (1990). Tenacious goal pursuit and flexible goal adjustment: Explication and age-related analysis of assimilative and accommodative strategies of coping. *Psychology and Aging*, *5*(1), 58–67. <https://doi.org/10.1037//0882-7974.5.1.58>

CALL. (2015). *Handbook, MDMP: Lessons and Best Practices: Vols. No. 15-06*. Center for Army Lessons Learned.

Crenshaw, J. T., & Yoder-Wise, P. S. (2013). Creating an Environment for Innovation: The Risk-Taking Leadership Competency. *Nurse Leader*, *11*(1), 24–27. <https://doi.org/10.1016/j.mnl.2012.11.001>

Duell, N., & Steinberg, L. (2019). Positive Risk Taking in Adolescence. *Child Development Perspectives*, *13*(1), 48–52. <https://doi.org/10.1111/cdep.12310>

Frese, M., & Zapf, D. (1994). Action as the core of work psychology: A German approach. In *Handbook of industrial and organizational psychology, Vol. 4, 2nd ed* (pp. 271–340). Consulting Psychologists Press.

Freund, A. M., & Baltes, P. B. (2002). Life-management strategies of selection, optimization and compensation: Measurement by self-report and construct validity. *Journal of Personality and Social Psychology*, *82*(4), 642–662. <https://doi.org/http://dx.doi.org/10.1037/0022-3514.82.4.642>

Frost, D. E., Fiedler, F. E., & Anderson, J. W. (1983). The Role of Personal Risk-Taking in Effective Leadership. *Human Relations*, *36*(2), 185–202. <https://doi.org/10.1177/001872678303600207>

Gestsdóttir, S. (2005). *Intentional self -regulation and positive youth development* [Ph.D.]. Tufts University.

Gestsdóttir, S., & Lerner, R. M. (2007). Intentional self-regulation and positive youth development in early adolescence: Findings from the 4-h study of positive youth development. *Developmental Psychology*, *43*(2), 508–521. <https://doi.org/http://dx.doi.org.ezproxy.library.tufts.edu/10.1037/0012-1649.43.2.508>

Haase, C. M., Heckhausen, J., & Wrosch, C. (2013). Developmental regulation across the life span: Toward a new synthesis. *Developmental Psychology*, *49*(5), 964–972. <https://doi.org/http://dx.doi.org.ezproxy.library.tufts.edu/10.1037/a0029231>

Heckhausen, J., & Schulz, R. (1995). A Life-Span Theory of Control. *Psychological Review*, *102*(2), 284–304.

Heckhausen, J., Wrosch, C., & Schulz, R. (2010). A motivational theory of life-span development. *Psychological Review*, *117*(1), 32–60. <https://doi.org/http://dx.doi.org.ezproxy.library.tufts.edu/10.1037/a0017668>

Horvath, P., & Zuckerman, M. (1993). Sensation seeking, risk appraisal, and risky behavior. *Personality and Individual Differences*, *14*(1), 41–52. <https://doi.org/10.1016/0191-8869(93)90173-Z>

Killgore, W. D. S., Cotting, D. I., Thomas, J. L., Cox, A. L., McGurk, D., Vo, A. H., Castro, C. A., & Hoge, C. W. (2008). Post-combat invincibility: Violent combat experiences are associated with increased risk-taking propensity following deployment. *Journal of Psychiatric Research*, *42*(13), 1112–1121. <https://doi.org/10.1016/j.jpsychires.2008.01.001>

Krueger, N., & Dickson, P. R. (1994). How Believing in Ourselves Increases Risk Taking: Perceived Self-Efficacy and Opportunity Recognition. *Decision Sciences*, *25*(3), 385–400. <https://doi.org/10.1111/j.1540-5915.1994.tb00810.x>

Lerner, R. M., Brentano, C., Dowling, E. M., & Anderson, P. M. (2002). Positive youth development: Thriving as the basis of personhood and civil society. *New Directions for Youth Development*, *2002*(95), 11–34. <https://doi.org/10.1002/yd.14>

Lerner, R. M., Freund, A. M., Stefanis, I. D., & Habermas, T. (2001). Understanding Developmental Regulation in Adolescence: The Use of the Selection, Optimization,and Compensation Model. *Human Development*, *44*(1), 29–50. <https://doi.org/10.1159/000057039>

Lipshitz, R., Klein, G., Orasanu, J., & Salas, E. (2001). Taking stock of naturalistic decision making. *Journal of Behavioral Decision Making*, *14*(5), 331–352. <https://doi.org/10.1002/bdm.381>

Napolitano, C. M., Bowers, E. P., Gestsdóttir, S., & Chase, P. A. (2011). Chapter 2 - The development of intentional self-regulation in adolescence: Describing, explaining, and optimizing its link to positive youth development. In R. M. Lerner, J. V. Lerner, & J. B. Benson (Eds.), *Advances in Child Development and Behavior* (Vol. 41, pp. 19–38). JAI. <https://doi.org/10.1016/B978-0-12-386492-5.00002-6>

Orasanu, J., & Connolly, T. (1993). The reinvention of decision making. In *Decision making in action: Models and methods* (pp. 3–20). Ablex Publishing.

Paquette, L., Lacourse, & Bergeron, J. (2009). Construction d’une Échelle de prise de risques et validation auprès d’adolescents pratiquant un sport alpin de glisse. [Construction of a scale of taking risk and validation near teenagers practitioner an alpine ski sports.]. *Canadian Journal of Behavioural Science / Revue Canadienne Des Sciences Du Comportement*, *41*(3), 133–142. <https://doi.org/10.1037/a0015256>

Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology*, *42*(1), 5–37. <https://doi.org/10.1037/0022-3514.42.1.5>

Sicard, B., Jouve, E., & Blin, O. (2001). Risk Propensity Assessment in Military Special Operations. *Military Medicine*, *166*(10), 871–874. <https://doi.org/10.1093/milmed/166.10.871>

Steinberg, L., Albert, D., Cauffman, E., Banich, M., Graham, S., & Woolard, J. (2008). Age differences in sensation seeking and impulsivity as indexed by behavior and self-report: Evidence for a dual systems model. *Developmental Psychology*, *44*(6), 1764–1778. <https://doi.org/10.1037/a0012955>

Veliz, P. T., Boyd, C. J., & McCabe, S. E. (2015). Competitive sport involvement and substance use among adolescents: A nationwide study. *Substance Use & Misuse*, *50*(2), 156–165. <https://doi.org/10.3109/10826084.2014.962049>

Wiese, B. S., Freund, A. M., & Baltes, P. B. (2000). Selection, Optimization, and Compensation: An Action-Related Approach to Work and Partnership. *Journal of Vocational Behavior*, *57*(3), 273–300. <https://doi.org/10.1006/jvbe.2000.1752>

Zsambok, C. E., & Klein, G. (2014). *Naturalistic Decision Making*. Psychology Press.

1. The moment preparation meets opportunity. [↑](#footnote-ref-21)