

A Conceptual Framework Linking Supervisor Support to Student Research Agency: A Self-Determination Perspective

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Abstract: *The supervisory relationship represents one of the most critical factors shaping graduate student development. Despite widespread recognition of its importance, theoretical understanding of how supervisor support influences student research agency remains fragmented. This paper proposes a conceptual framework that links supervisor support to graduate students' exercise of research agency through the lens of self-determination theory. The framework distinguishes three dimensions of supervisor support (autonomy, competence, and relatedness) and posits that basic psychological needs satisfaction mediates the relationship between supervisor support and student research agency. The analysis further identifies a parallel pathway wherein need frustration constrains agency. Boundary conditions, including individual differences, developmental stage, and the support-independence balance, moderate these core relationships. The paper concludes with implications for efficient supervisory practice.*

Keywords: Self-determination theory, Supervisor support, Basic psychological needs, Research agency, Graduate education.

1. Introduction

Graduate education occupies a central position in contemporary higher education. It serves as a crucial site for cultivating talent reserves in knowledge production. However, current graduate education exhibits troubling patterns: widespread psychological distress among students and increasing delays in degree completion (Chi et al., 2023[1]; University World News, 2025 [2]), suggesting systemic challenges in cultivating independent student researchers. The supervisor-student relationship stands at the center of these challenges. This relationship serves as the main developmental setting for graduate researchers, yet its quality varies greatly. Central to this variation is the cultivation of research agency. Without the progressive exercise of agency, technical competence alone proves insufficient for graduate students' transitions to independent researchers.

Conceptualization of graduate student agency in research activities is fragmented (Emirbayer & Mische, 1998[3]; Archer, 2003[4]; Klemencic, 2023[5]). In this study, research agency is operationally defined as students' proactive capacity to initiate, regulate, and take responsibility for their research activities (Biesta & Tedder, 2007[6]; Pyhältö et al., 2012[7]). It is the essential condition through which students develop the self-directed capacity to identify problems, design inquiries, and contribute original knowledge. However, theoretical work connecting this agency to specific supervisor behaviors remains underdeveloped. Although research consistently associates supportive supervision with improved graduate student wellbeing and productivity (Bai et al., 2023[8]; Wu et al., 2025[9]), the mechanisms through which supervisor actions enable or constrain graduate research agency require more precise exploration. This gap limits practical guidance for supervisors and theoretical coherence in graduate education. This paper addresses this gap by developing a conceptual framework that specifies how supervisor support relates to the exercise of graduate research agency. Drawing on self-determination theory, the framework identifies distinct dimensions of supervisor support and their

specific mechanisms on graduate student research agency.

2. The Theoretical Lens: Self-Determination Theory

Self-Determination Theory (SDT) serves as the theoretical lens for this conceptual framework examining how supervisor support relates to graduate students' exercise of research agency. Developed by Deci and Ryan (1985[10]), SDT posits that human motivation and psychological development depend on the satisfaction of three basic psychological needs for autonomy (the need to experience volition and self-endorsement in one's actions), competence (the need to feel effective in interacting with the environment), and relatedness (the need to feel connected to and cared for by others). These three basic needs serve as essential nutrients for psychological growth in the same way that vitamins and minerals are necessary for physical health. Their satisfaction enables intrinsic motivation, psychological well-being, and optimal development, while their deprivation produces fragmentation and dysfunction (Ryan & Deci, 2000[11]).

In the context of graduate education, these needs correspond to students' desires for volitional research decision-making, confidence in their scholarly capabilities, and meaningful connection with their supervisors. Satisfaction of these needs enables progressive internalization of research values, moving from external regulation controlled by rewards or punishments, through introjected regulation controlled by internal pressures, toward identified and integrated regulation where behavior becomes valued as personally important. This progression matters directly for research agency. Students who remain at controlled levels may follow supervisor demands but do not exercise true agency, which requires at least identified regulation where the student self-endorses and values the behavior.

SDT specifies distinct supervisory behaviors that influence these needs differentially. Autonomy-supportive practices, such as offering meaningful choice, acknowledging student

perspectives, and explaining the rationale behind requirements, enable students to experience research activities as self-concordant and to integrate them into their emerging researcher identity. Competence-focused support, including appropriately challenging tasks and informational feedback that identifies specific improvement strategies, builds the self-efficacy required for independent problem-solving. Relatedness-supportive behaviors, marked by genuine warmth and reliable presence, create the safety needed for honest self-expression and intellectual risk-taking. Conversely, when supervisors employ controlling behaviors, impose excessive demands, or exhibit interpersonal neglect, these needs are thwarted and students may remain stuck at external or introjected levels, responding with compliance or withdrawal rather than agency.

This theoretical framework maps directly onto the developmental trajectory of graduate researchers. Graduate education requires students to shift from structured coursework and guided apprenticeship to independent scholarly production, a transition that demands active agency and self-determined regulation. SDT explains how this agency develops by specifying the mechanisms through which supervisor support operates, the interpretive processes that mediate its effects, and the concrete dimensions of support that can be cultivated in practice. By positioning basic psychological need satisfaction as the central explanatory mechanism, this framework moves beyond descriptive accounts of supervisor-student interactions toward a theoretically grounded understanding of how social-contextual conditions enable or constrain graduate students' exercise of research agency.

3. Supervisor Support as Need-Satisfying Social Context

SDT states that basic psychological needs are met or thwarted within social contexts (Ryan & Deci, 2017 [12]). These contexts include supervisory relationships, institutions, and cultures. For graduate students, the supervisory relationship serves as the primary social context, making supervisor support a key factor in need satisfaction and agency development. This centrality of supervision stems from the distinctive structural position that supervisors occupy within graduate education. Generally speaking, they control critical research resources including fellowship funding, research equipment, and network access. They evaluate students' work and determine whether students have progressed through or completed the program requirements. They also demonstrate expert research practices and model professional identities that students can follow. These multiple roles give supervisors substantial influence over the psychological environment of graduate students. Aligning with SDT, the proposed framework of this paper views supervisor support as a contextual factor that affects graduate students' basic psychological need satisfaction. Autonomy-supportive behaviors create environments where students have choice and develop ownership over their research. Competence-supportive behaviors provide conditions where students build confidence and see themselves as capable researchers. Relatedness-supportive behaviors build relational contexts where students feel connected to their scholarly community and important as emerging colleagues. These

three interrelated dimensions form the foundation for understanding how supervisor support influences graduate students' exercise of research agency.

3.1 Autonomy Support

Autonomy support refers to supervisory behaviors that support students' sense of choice and self-endorsement (Reeve, 2009 [13]). In graduate education contexts, these behaviors include offering meaningful options regarding research questions and methods, recognizing student views even when they differ from supervisor preferences, providing reasons for suggestions rather than relying on authority, and reducing controlling language, monitoring, and conditional approval.

These behaviors support research agency by helping students see themselves as the source of their research actions. When students feel their work reflects their own interests and values, they develop ownership of their research direction. This ownership leads to continued engagement with the difficult and unclear tasks common in research work. Students who receive autonomy support show more initiative in defining research problems and persist when facing obstacles.

Autonomy support in graduate supervision involves important challenges of balance. On one hand, supervisors possess expertise that properly guides student development. On the other hand, complete absence of direction would constitute neglect rather than support. Consequently, effective autonomy support must operate within clear structures that build student skills while respecting their growing expertise. In practice, this means supervisors provide guidance and feedback that help students make informed choices rather than offering unlimited freedom.

3.2 Competence Support

Competence support refers to behaviors that help students develop the skills required for effective research. This concept draws on sociocultural perspectives on learning, which emphasize guided participation in authentic research activities. In practice, supervisors provide competence support in several ways. First, they simplify complex tasks by dividing large projects into smaller steps that students can manage. As a result, students build skills progressively without becoming overwhelmed by the full scope of the work. Second, they offer specific feedback that acknowledges what students do well and identifies concrete steps for improvement. Consequently, students can recognize their progress and understand how to advance their capabilities. Third, they make their own expert thinking visible by sharing how they approach research problems and decisions. In this way, students gain a model they can observe and adapt for their own developing practice. Finally, they design challenges that extend slightly beyond students' current skills. Therefore, students stretch their abilities while remaining in conditions where success is possible.

These behaviors can effectively support research agency because they help graduates build their beliefs in their own abilities. When students feel capable, they are more willing to take on challenges. They can also deal with uncertainty

because they trust their problem-solving skills. As a result, they adjust to new situations more easily. This confidence then allows them to exercise agency in difficult research settings where results remain unclear.

Time plays a key role in competence support. At the start of graduate study, students lack the skills to manage complex research tasks on their own. So they usually need more help from supervisors. As students gain skills through practice, they can handle more responsibility. Supervisors then need to step back and let students work more independently. This shift from dependence to autonomy is the main task of graduate education. But this change is not in a linear way. Students often face new problems that go beyond what they can currently deal with. They may also fall back on old habits when they feel stressed or when things go wrong. Experienced supervisors monitor these signs and adjust their support accordingly. They recognize when students require additional guidance, evidenced by work avoidance or repeated errors. They also recognize when students demonstrate readiness for greater independence, indicated by novel idea generation or strategic feedback-seeking. This ongoing adjustment balances student autonomy with guidance. It ensures that support matches students' current level, rather than assuming that all students progress at the same rate.

3.3 Relatedness Support

Relatedness support involves building warm and respectful relationships between supervisors and students. Supervisors can build such relationships through several core practices. They attend to students as whole persons rather than only as sources of research output. They make themselves available when students encounter difficulties. They recognize and affirm students' developing expertise. Besides, they also can acknowledge the power imbalance in supervision and manage it with care, ensuring that respect operates within realistic conditions.

These practices support research agency because they create conditions where students feel safe to take intellectual risks. This safety matters because research work necessarily involves failure, whether in experiments that produce unexpected results or in hypotheses that prove incorrect. When students have established trust with their supervisors, they are more likely to persist through such setbacks, seek help when needed, and maintain openness to new approaches. In contrast, students who feel their value depends only on performance tend to avoid risk and limit their growth.

Relatedness support promotes the internalization of academic values. Warm and respectful supervisory relationships foster a sense of belonging within the scholarly community. These belongings shape students' self-perception from peripheral participants to legitimate members. Such identity transformation sustains the exercise of agency. Students engage in research out of genuine commitment rather than external pressure to complete their degrees.

4. The Mediating Mechanism of Basic Psychological Needs

4.1 The Enabling Pathway: Need Satisfaction and

Fostered Agency

The present framework proposes that basic psychological needs satisfaction mediates the relationship between supervisor support and graduate research agency. This mediation implies that supervisor support does not always directly produce research agency. Instead, it creates conditions conducive to graduates' basic psychological needs satisfaction, which in turn enables students to exercise research agency.

4.1.1 From Support to Need Satisfaction

Supervisor behaviors operate as contextual cues that shape basic psychological need satisfaction (Ryan & Deci, 2017 [12]). Autonomy support acknowledges students' perspectives, offers meaningful rationales, and uses non-controlling language. Such practices convey that the research environment welcomes volitional functioning, and students experience this recognition as satisfaction of their need for autonomy. Competence support provides optimal challenges, delivers informational feedback, and communicates high expectations. Such provisions indicate available resources for effective execution, and students experience this guidance as confirmation of their capability. Relatedness support displays warmth, offers emotional support, and invests in personal growth. Such engagement demonstrates genuine caring, and students experience this security as fulfillment of their need for relatedness.

These signals determine graduate students' experiences of autonomy satisfaction (volition in topic and method choices), competence satisfaction (effectiveness in research tasks), and relatedness satisfaction (connection within the scholarly community). Autonomy satisfaction enables students to pursue research questions aligned with personal intellectual interests and to endorse methodological decisions as truly their own. Competence satisfaction fosters confidence in executing technical procedures, analyzing complex data, and producing scholarly outputs that meet disciplinary standards. Relatedness satisfaction establishes a secure base from which students seek guidance, share vulnerabilities, and engage in collaborative intellectual exchange. These satisfying experiences energize autonomous motivation and enable agentic functioning. Specifically, students actively negotiate research directions with supervisors, seek feedback strategically from multiple sources, and mobilize resources across institutional and disciplinary networks.

In summary, supervisor support operates through a sequential mechanism. First, specific behaviors send cues that satisfy students' basic psychological needs. Then, these satisfying experiences build or enhance students' autonomous motivation. Finally, this motivation fosters students' exercise of agency in their research activities.

4.1.2 From Need Satisfaction to Exercise of Agency

The framework proposes that need satisfaction influences agency through motivational and cognitive mechanisms. The first mechanism involves motivational energization. Basic need satisfaction produces autonomous motivation. This motivation manifests in persistent engagement with research

tasks, flexible problem-solving strategies, and proactive resource utilization. The second mechanism involves value internalization. Satisfied needs facilitate the integration of academic values into the self-concept. This integration results in behavioral engagement grounded in personal meaning rather than external contingency.

Satisfaction of these three basic psychological needs generates distinct functional outcomes. Autonomy satisfaction produces volitional functioning. The experience of choice in research decisions generates psychological ownership. Ownership enables independent goal construction and sustained effort allocation. Competence satisfaction produces self-efficacious functioning. The experience of capability generates challenge approach tendencies. These tendencies enable strategic adaptation to methodological obstacles. Relatedness satisfaction produces secure functioning. The experience of connection generates risk tolerance. This tolerance enables intellectual exploration without defensive self-protection.

Graduate education presents distinctive challenges that amplify the importance of these mechanisms. Research tasks require sustained self-regulation. Methodological decisions demand independent judgment with limited guidance. Peer competition and evaluation pressures threaten relational security. Students navigate these challenges while developing scholarly identities. Need satisfaction provides the psychological foundation for this navigation. Students who enter the dissertation phase with satisfied needs demonstrate greater capacity to negotiate topic changes, seek feedback, and mobilize resources.

4.2 The Impeding Pathway: Need Frustration and Constrained Agency

The framework also recognizes need frustration as a barrier to the exercise of research agency. Need frustration occurs when supervisors block rather than support basic psychological needs. This blockage produces controlled motivation or amotivation. Three specific forms of need frustration impede agency development. Autonomy frustration produces heteronomy. External forces govern student action in place of self-regulation. Students may comply with requirements without genuine engagement. Alternatively, they may resist requirements entirely. Both responses indicate a lack of volitional functioning. Competence frustration produces helplessness. Students develop the belief that success remains unattainable regardless of effort expenditure. This belief undermines persistence and strategic action. Students abandon challenging tasks or avoid novel research approaches. Relatedness frustration produces isolation. Students experience disconnection from both the supervisory relationship and the broader scholarly community. This isolation removes essential sources of guidance and emotional support. Students cannot mobilize resources effectively when they lack secure relational bases.

Need frustration limits agency by causing defensive reactions. Students who experience autonomy frustration may avoid taking initiative to prevent errors. They may also hide problems from supervisors to avoid judgment. Students who experience competence frustration may avoid challenges or

may persist without success. They may also refuse to try new methods for fear of confirming their failure. Students who experience relatedness frustration may withdraw from social interaction and miss opportunities for support. They may also become overly dependent on peer validation or avoid seeking feedback. The framework thus predicts that need frustration reduces agency. This negative effect operates independently of the positive effects produced by need satisfaction.

5. Conclusions

This paper proposes a conceptual framework that links supervisor support to graduate students' exercise of research agency through the lens of self-determination theory. The framework posits that supervisor support enables the exercise of research agency through a bifurcated mechanism comprising two distinct psychological processes. The enabling pathway operates through the satisfaction of basic psychological needs. Supervisor behaviors that support autonomy provide graduate students with meaningful choice in research decisions, competence support builds confidence in methodological execution, and relatedness support fosters a sense of belonging within the scholarly community. When these needs are satisfied, they fuel autonomous motivation—characterized by genuine interest and personal investment in research pursuits. This motivation subsequently manifests in three interrelated forms of agentic action: students negotiate project directions with supervisors rather than passively accept assignments, strategically seek feedback from multiple sources rather than await guidance, and mobilize resources across institutional and disciplinary networks rather than work in isolation. The impeding pathway operates through the frustration of these same needs. Supervisor behaviors that thwart autonomy create heteronomy, wherein external forces govern action rather than self-regulation; competence frustration engenders helplessness, wherein students perceive success as impossible regardless of effort; and relatedness frustration produces isolation, wherein students lose connection to guidance and support. These frustrations drive students toward controlled motivation or amotivation—acting from external pressure or disengaging entirely. Consequently, defensive reactions replace proactive engagement, and the exercise of agency diminishes. This bifurcated structure yields empirically testable propositions. Supportive behaviors should correlate positively with need satisfaction and autonomous motivation, whereas controlling behaviors should correlate positively with need frustration and controlled motivation or amotivation. Researchers can examine these propositions through longitudinal designs or experimental manipulations to identify which supervisory practices most strongly predict student agency across specific research phases. Educators can subsequently translate these findings into training programs that help supervisors recognize need-frustrating behaviors and adopt need-supportive alternatives.

Three factors limit the core relationships between supervisor support and the exercise of student research agency. First, individual differences shape how students interpret and respond to support. Students from rigid educational backgrounds may initially perceive autonomy support as unfamiliar or even distressing. Students with histories of academic struggle often require extended periods to establish

trust in supervisory relationships. Students with substantial prior research experience may interpret close guidance as intrusive oversight rather than necessary assistance. These differential interpretations moderate the effects of support on need satisfaction. Second, stage of study determines the appropriate configuration of support. Early-stage graduate students typically require intensive competence support to acquire foundational research skills. Mid-stage students require increasing autonomy support as they assume ownership of their research trajectories. Relatedness support remains necessary throughout the doctoral journey, though its expression changes: supervisors initially provide emotional reassurance, and later demonstrate respect for students as emerging colleagues. Third, effective support requires balancing assistance with independence. Supervisors must provide sufficient assistance to ensure task completion, yet must also withdraw sufficiently to necessitate self-directed functioning. Excessive assistance risks producing dependence, which subsequently constrains the exercise of agency. The optimal balance involves providing enough support to enable progress, but not so much that students relinquish self-direction.

The framework carries implications for supervisory practice, particularly regarding the calibration of support to student developmental readiness. The same supervisory behavior produces divergent effects across research stages, necessitating stage-sensitive adaptation. Supervisors must calibrate competence support to skill acquisition levels. When students lack methodological proficiency, direct instruction satisfies the need for competence by enabling skill acquisition. However, premature autonomy support, which offers choice before competence consolidation, frustrates this same need. Conversely, when students have mastered requisite skills, autonomy support satisfies the need for self-direction, whereas excessive guidance frustrates the need for autonomy. Effective supervision thus requires progressive scaffolding. Supervisors provide sufficient structure to ensure task completion while systematically reducing that structure to necessitate independent functioning. This calibrated reduction prevents both competence frustration and autonomy frustration. Supervisors must similarly calibrate relatedness support to maintain optimal connection. Students require relational security to seek guidance and mobilize resources across institutional and disciplinary networks. Without this connection, they cannot access the support necessary for research progress. However, excessive relational closeness creates dependency that precludes independent problem-solving. Supervisors must therefore sustain differentiated connection, which maintains sufficient proximity to ensure accessibility and sufficient distance to necessitate self-reliance. This calibration proves challenging because the optimal level varies across individual students and evolves as students develop, requiring ongoing diagnostic assessment rather than fixed protocols.

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