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Short Report

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Developmental Process and Structural Dynamics of Sustainability Consciousness in Job-Hunting University Students: A Path Analysis Approach

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Abstract

While the multi-dimensional nature of sustainability consciousness among university students has been established, the structural dynamics and developmental pathways connecting cognitive understanding, career value alignment, and proactive behavior remain unclarified. Building upon the newly validated Sustainability Consciousness Scale for University Students, this study investigates the structural relationships and developmental processes among three primary dimensions: **Understanding and Empathy** (F3), **Value Orientation** (F2), and **Initiative** (F1). Survey data from 366 Japanese university students undergoing career preparation were analyzed using structural equation modeling. The structural path model demonstrated excellent fit to the empirical data (CFI = .952, TLI = .934, RMSEA = .063, SRMR = .045). Results revealed that cognitive comprehension and empathy (F3) directly and powerfully drive career value orientation ($\beta = .686, p < .001$) and proactive initiative ($\beta = .627, p < .001$). Furthermore, personal value orientation (F2) significantly mediates the trajectory toward proactive behavioral engagement ($\beta = .238, p = .014$), accounting for 65.5% of the variance in Initiative ($R^2 = .655$). These findings provide empirical evidence for a sequential developmental pathway of sustainability consciousness, offering vital insights for designing targeted university career guidance and corporate ESG communications.

Keywords: Sustainability Consciousness, Developmental Dynamics, Career Support, University Students, Job Hunting

1 Introduction

In response to the global emphasis on Sustainable Development Goals (SDGs) and Environmental, Social, and Governance (ESG) criteria, corporate hiring practices and university career counseling have undergone a paradigm shift. Recent empirical research has demonstrated that young adults actively incorporate corporate sustainability commitments into their career decision-making processes [7]. To operationalize this psychological phenomenon, Kato et al. [1] developed and validated the Sustainability Consciousness Scale for University Students in Job-Hunting Activities, identifying a robust 3-factor structure consisting of **Initiative** (F1), **Value Orientation** (F2), and **Understanding and Empathy** (F3).

Although factor-analytic studies have validated the multidimensionality of sustainability consciousness [3, 1], the dynamic causal mechanisms and developmental sequences through which these dimensions interact remain unexplored. Specifically, it remains unclear whether cognitive knowledge and empathy automatically translate into proactive behavioral initiative, or whether personal career value integration serves as a crucial mediating bridge.

Understanding this structural progression is critical for developing effective intervention strategies. If sustainability consciousness follows a developmental path—originating from cognitive/empathic awareness, advancing through career identity integration, and culminating in self-directed behavior—educational and organizational programs can be strategically structured to guide students along this trajectory.

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To address these empirical gaps, the present study formulates a structural path model to examine the direct and indirect path mechanisms among the three factors of sustainability consciousness. Specifically, we investigate the following research questions:

- **RQ1:** Does fundamental cognitive understanding and empathy (F3) directly drive both career value orientation (F2) and self-directed behavioral initiative (F1)?
- **RQ2:** Does personal career value orientation (F2) mediate the relationship between cognitive understanding (F3) and proactive initiative (F1)?

2 Method

2.1 Ethical Considerations

The research protocol, including the survey design, participant protection measures, and data management plans, was formally reviewed and approved by the Research Ethics Committee of Beyond Myself LLC. Prior to data collection, all participants were informed regarding the purpose of the investigation, the voluntary nature of their involvement, and the strict confidentiality and anonymity of their responses. Digital informed consent was obtained from all respondents prior to questionnaire administration.

2.2 Participants and Data Collection

Participants comprised 366 university students in Japan who were actively engaged in or preparing for career selection and job-hunting activities. Data were collected via an online survey platform.

2.3 Measurement Instrument

Sustainability consciousness was evaluated using the 12-item Sustainability Consciousness Scale [1]. The instrument comprises three 4-item subscales rated on a 5-point Likert scale (1 = *Strongly Disagree* to 5 = *Strongly Agree*):

1. **Initiative (F1):** Proactive information searching and sustainable daily practices (e.g., s10, s4, s5, s3).
2. **Value Orientation (F2):** Alignment of career aspirations and personal values with societal contribution (e.g., s14, s13, s16, s15).
3. **Understanding and Empathy (F3):** Cognitive grasp of SDGs and empathy toward social issues (e.g., s1, s2, s7, s6).

2.4 Structural Equation Modeling Strategy

To test the developmental path hypotheses, structural equation modeling (SEM) was performed using Maximum Likelihood (ML) estimation. Residual covariances were included for closely related item pairs (s13 $\leftrightarrow$ s14, s1 $\leftrightarrow$ s2, s3 $\leftrightarrow$ s7) as established in the baseline measurement model [1]. The structural paths specified F3 (Understanding and Empathy) as an exogenous latent predictor predicting both F2 (Value Orientation) and F1 (Initiative), while F2 was specified as a mediating predictor of F1.

Model fit was evaluated using standard goodness-of-fit statistics: Comparative Fit Index (CFI $\geq$.90), Tucker-Lewis Index (TLI $\geq$.90), Root Mean Square Error of Approximation (RMSEA $\leq$.08), and Standardized Root Mean Square Residual (SRMR $\leq$.08).

3 Result

3.1 Model Fit Evaluation

The hypothesized structural path model terminated normally. As summarized in Table 1, the model demonstrated an excellent fit to the empirical data: $\chi^2(48) = 118.439, p < .001$; CFI = .952; TLI = .934; RMSEA = .063 (90% CI [.049, .078]); and SRMR = .045.

Table 1: Goodness-of-Fit Indices for the Structural Path Model ($N = 366$)

Model	χ^2	df	CFI	TLI	RMSEA	[90% CI]	SRMR
Structural Path Model	118.439	48	.952	.934	.063	[.049, .078]	.045

3.2 Structural Path Analysis

All specified direct structural paths were statistically significant. The structural relations and standardized path coefficients (β) are illustrated in Figure 1.

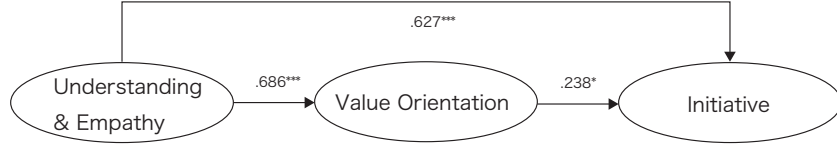


Figure 1: Structural path model showing the developmental pathways of sustainability consciousness. Path coefficients represent standardized estimates (β). *** $p < .001$, * $p < .05$.

As hypothesized in RQ1, **Understanding and Empathy** (F3) exerted a direct, substantial positive effect on **Value Orientation** (F2) ($\beta = .686, p < .001$) as well as on **Initiative** (F1) ($\beta = .627, p < .001$). Regarding RQ2, **Value Orientation** (F2) significantly predicted **Initiative** (F1) ($\beta = .238, p = .014$).

The explained variance (R^2) for the endogenous latent variables was substantial: the model accounted for 47.1% of the variance in **Value Orientation** ($R^2 = .471$) and 65.5% of the variance in **Initiative** ($R^2 = .655$).

4 Discussion

The present study successfully models the dynamic relationships among the three components of sustainability consciousness, providing robust empirical evidence for a sequential developmental framework: **Understanding and Empathy** (F3) $\rightarrow$ **Value Orientation** (F2) $\rightarrow$ **Initiative** (F1).

4.1 Theoretical Implications

First, the dominant path from Understanding and Empathy to Value Orientation ($\beta = .686$) indicates that cognitive comprehension and emotional resonance regarding societal challenges form the indispensable foundation for personal value internalization. Students must first understand the systemic nature of sustainability before they can integrate social contribution into their career identity.

Second, the structural equation model confirms that behavioral initiative (F1) is driven through dual pathways: a direct cognitive-empathic drive ($\beta = .627$) and an indirect drive mediated by career value orientation ($\beta = .238$). Together, these paths explain 65.5% of the variance in proactive behaviors, demonstrating that active engagement with corporate ESG activities is not a detached habit, but a direct downstream reflection of underlying understanding and career values.

4.2 Practical and Educational Applications

These empirical findings offer clear guidelines for higher education and corporate recruitment:

1. **Sequential Educational Design:** University career programs should avoid jumping directly to demanding action plans (Initiative). Instead, interventions should start by cultivating foundational awareness and social empathy (Understanding and Empathy), followed by reflective workshops connecting societal issues to individual career goals (Value Orientation).
2. **Targeted ESG Talent Communication:** Corporate recruiters should design ESG communications that appeal to both cognitive understanding and personal value alignment, rather than merely showcasing corporate sustainability credentials.

4.3 Limitations and Future Directions

While structural path modeling provides strong support for the hypothesized directional paths, cross-sectional survey data inherently limit definitive causal claims. Future research should apply longitudinal designs tracking cohort dynamics across the job-hunting period and into early post-graduation employment to assess the long-term predictive validity of these developmental pathways on workplace retention and job satisfaction [5].

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