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When Significant Paths Mislead: Construct Redundancy in Integrated Social Media Marketing Models

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Abstract

Purpose–*Integrated social media marketing (SMM) models estimated using partial least squares structural equation modelling (PLS-SEM) are increasingly used to identify the relative importance of multiple marketing drivers. However, these models often combine conceptually related constructs whose empirical distinctiveness is rarely examined beyond routine measurement diagnostics. This study investigates how construct redundancy influences the interpretation of structural relationships and proposes a framework for improving diagnostic and interpretive practice.*

Design/methodology/approach–*Building upon the literature on construct validity and PLS-SEM, this study develops a conceptual framework explaining two mechanisms through which construct redundancy arises: literal construct overlap and common-cause entanglement. An empirical illustration based on an integrated SMM model is used to identify the characteristic empirical signature of construct redundancy. These theoretical and empirical insights are then synthesised into a sequential diagnostic protocol linking measurement evaluation with structural interpretation.*

Findings–*The study demonstrates that construct redundancy should not be regarded solely as a measurement-quality issue. Instead, it undermines the interpretation of structural coefficients by weakening the assumption that latent constructs represent independent theoretical mechanisms. Construct redundancy leaves a recognisable empirical signature characterised by loss of construct distinctiveness and structural instability. Based on these findings, a sequential diagnostic protocol is proposed in which evidence from conceptual specification, measurement evaluation, and structural diagnosis jointly determines whether substantive interpretation of structural relationships is warranted.*

Originality/value–*Rather than introducing new statistical indices, this study reframes construct distinctiveness as an interpretive prerequisite for structural equation modelling. By connecting measurement evaluation with structural interpretation, it provides a coherent methodological framework for researchers, reviewers, and editors working with integrated PLS-SEM models.*

Keywords: *Construct redundancy; Discriminant validity; Structural interpretation; Social media marketing; Measurement validity*

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1. Introduction

Integrated models have become a dominant analytical framework for explaining consumer responses to social media marketing (SMM). Rather than examining isolated antecedents, recent studies increasingly combine constructs derived from technology acceptance, planned behaviour, innovation adoption, and relationship marketing perspectives within a single structural model (Kokash et al., 2025). These models commonly include constructs such as perceived usefulness, perceived ease of use, social influence, personal innovativeness, brand trust, brand image, engagement, perceived value, and purchase intention. Such integrated frameworks are attractive because they promise a more comprehensive explanation of consumer purchase intention while allowing researchers to compare the relative importance of different marketing drivers (Salhab et al., 2023). Owing to its prediction-oriented logic and flexibility in estimating complex latent-variable models, partial least squares structural equation modelling (PLS-SEM) has become a widely used approach for analysing these integrated relationships in marketing and consumer research Sarstedt et al., 2021).

A notable characteristic of this growing body of research is the apparent consistency of its empirical findings. Recent SMM and influencer-marketing studies frequently report acceptable measurement properties, high explanatory power, and multiple statistically significant structural paths (Alnaser et al., 2024). Researchers often translate these statistical results into managerial recommendations by comparing standardized path coefficients. Such findings appear compelling because they satisfy conventional reporting requirements, including reliability, convergent validity, discriminant validity, collinearity assessment, and significance testing (Becker et al., 2023). Implicitly, these results encourage managers to prioritize those marketing factors that exhibit the largest standardized effects.

However, statistical significance alone does not guarantee meaningful structural interpretation. A structural model assumes that each latent construct represents an empirically distinguishable theoretical mechanism. If several constructs capture substantially overlapping psychological evaluations, statistically significant path coefficients may reflect the allocation of shared variance rather than independent causal influences (Cheung et al., 2023). Under these circumstances, differences among standardized coefficients become increasingly unstable, and managerial recommendations based on their relative magnitudes become difficult to justify. Consequently, the fundamental question is not merely whether structural paths are statistically significant, but whether the constructs connected by those paths are sufficiently distinguishable to support causal interpretation.

Although discriminant validity remains an essential component of construct validation, existing methodological practice often treats it as one diagnostic criterion within the measurement model rather than as a prerequisite for interpreting structural relationships. Contemporary PLS-SEM and SEM guidelines continue to recommend indices such as the Fornell‑Larcker criterion, the heterotrait‑monotrait ratio, and collinearity diagnostics as part of measurement and structural model assessment (Ringle et al., 2023). Yet relatively little attention has been paid to the broader implications of construct redundancy for causal inference, mediation analysis, or the interpretation of managerial priorities. Recent work on construct clarity and jingle‑jangle fallacies further suggests that overlapping construct definitions and item content can weaken cumulative knowledge and reduce the interpretability of empirical findings (Wulff & Mata, 2025). As a result, discriminant validity should be evaluated not only as a measurement statistic but also as an interpretive condition that determines whether substantive conclusions drawn from structural models are warranted.

This paper argues that construct redundancy represents not merely a measurement problem but a threat to structural interpretation. We contend that when integrated SMM models combine conceptually overlapping constructs measured through single-source, self-report data, discriminant-validity failure should not be viewed as a minor statistical imperfection. Instead, it undermines the assumption that structural coefficients represent independent causal mechanisms and consequently challenges the validity of ranking managerial levers according to their estimated effects.

Against this background, this study makes three contributions. First, it develops a conceptual explanation of why construct redundancy emerges in integrated SMM models by distinguishing two fundamentally different mechanisms: literal measurement overlap and common-cause entanglement. Second, it identifies the characteristic empirical signature produced by construct redundancy through a transparent worked example based on an empirical SMM study. Third, it proposes a sequential diagnostic protocol that repositions construct distinctiveness as a prerequisite for structural interpretation rather than merely another measurement statistic. Rather than introducing new statistical indices, the proposed protocol reorganises existing methodological procedures into a decision framework in which failure at an earlier diagnostic stage constrains the interpretation of all subsequent structural results.

The illustrative case deliberately comes from the authors' own companion study. This choice avoids selectively criticising previous researchers while demonstrating that construct redundancy can arise even in carefully designed empirical investigations conducted according to prevailing methodological standards. The objective is therefore not to establish the prevalence of construct redundancy across the SMM literature but to provide a transparent demonstration of how the proposed diagnostic protocol identifies and addresses a methodological problem that conventional reporting practices may overlook.

2. Why Construct Redundancy Matters

2.1 The Hidden Assumption of Independent Marketing Levers

One of the principal attractions of integrated social media marketing (SMM) models is their ability to estimate the relative importance of multiple marketing antecedents within a single analytical framework. By simultaneously incorporating constructs such as perceived usefulness, perceived ease of use, social influence, personal innovativeness, brand trust, and overall SMM strategy, researchers seek not only to explain consumer purchase intention but also to determine which managerial interventions are likely to generate the greatest behavioural impact (Salhab et al., 2023). Standardized structural coefficients are therefore frequently interpreted as evidence for prioritising one marketing lever over another.

Such interpretations, however, rest upon an important but largely implicit assumption: each latent construct represents an empirically distinct theoretical mechanism. The comparison of standardized

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path coefficients is meaningful only when each construct captures a unique aspect of consumer cognition or behaviour. Under this assumption, structural coefficients quantify the independent contribution of different marketing drivers, allowing researchers to compare their relative explanatory power and formulate evidence-based managerial recommendations (Hair et al., 2022).

This assumption is rarely questioned in empirical studies because construct distinctiveness is often taken for granted once acceptable reliability and convergent validity have been established. However, reliability demonstrates internal consistency within a construct rather than empirical separation between constructs, while convergent validity confirms that indicators adequately represent their intended latent variable (Cheung et al., 2023). Neither provides direct evidence that theoretically different constructs are empirically distinguishable.

Consequently, before researchers attempt to determine which marketing lever matters most, they must first establish that the levers themselves genuinely exist as separate constructs. Otherwise, differences among standardized coefficients may simply reflect alternative statistical representations of the same underlying consumer evaluation rather than independent theoretical mechanisms (Guenther et al., 2023).

2.2 Construct Redundancy as a Threat to Structural Interpretation

Within the structural equation modelling literature, insufficient discriminant validity has traditionally been regarded as a measurement-quality problem. When latent constructs exhibit excessive correlations or overlapping indicators, researchers are generally encouraged to improve scale specification, reassess problematic items, or reconsider whether conceptually adjacent constructs should remain separated before proceeding to structural interpretation (Cheung et al., 2023). This perspective has substantially improved the quality of measurement models and has become standard practice in contemporary PLS-SEM research.

Nevertheless, viewing construct redundancy solely as a measurement issue overlooks its broader implications for theory testing. Structural equation models are designed to partition the variance of an outcome variable into distinct explanatory components. When multiple predictors represent highly overlapping psychological evaluations, this partitioning becomes increasingly unstable because predictors compete to explain essentially the same variance in the dependent variable. Under these circumstances, estimated structural coefficients become highly sensitive to multicollinearity, model specification, sampling fluctuations, and minor changes in indicator composition (Guenther et al., 2023).

The consequence is not merely statistical inconvenience but interpretive uncertainty. Differences among standardized coefficients no longer necessarily indicate genuine differences in causal influence; instead, they may reflect how the estimation procedure allocates shared variance among highly correlated predictors. Similarly, mediation effects may become unstable because the mediator and predictor are themselves insufficiently distinguishable. Structural coefficients that appear statistically significant may therefore provide only limited evidence regarding independent theoretical mechanisms (Haji-Othman et al., 2024).

From this perspective, construct redundancy challenges the validity of substantive conclusions rather than merely the adequacy of measurement. It affects the interpretation of causal relationships, the credibility of mediation analyses, and the defensibility of managerial recommendations derived from comparisons of standardized effects. Discriminant validity should therefore be regarded not simply as one component of measurement quality but as a necessary condition for meaningful structural interpretation. Only when latent constructs are empirically distinguishable can structural coefficients reasonably be interpreted as estimates of different theoretical mechanisms (Lim, 2024).

2.3 Limitations of Current Diagnostic Practice

Over the past decade, methodological research has significantly strengthened the assessment of measurement quality in PLS-SEM. Current reporting standards recommend a comprehensive evaluation of internal consistency reliability, convergent validity, discriminant validity, predictive ability, and collinearity before interpreting structural relationships (Ringle et al., 2023). In particular, the heterotrait–monotrait ratio (HTMT) has become a widely used criterion for assessing discriminant validity and for complementing traditional approaches such as the Fornell–Larcker criterion (Cheung et al., 2023).

Despite these methodological advances, existing diagnostic practice remains primarily measurement-oriented. Reliability, convergent validity, discriminant validity, and collinearity are generally presented as independent statistical diagnostics, each assessed against predefined threshold values. Once these criteria have been reported, researchers typically proceed directly to interpreting structural paths, testing mediation hypotheses, and deriving managerial implications. Even when substantial construct overlap is detected, relatively little attention is paid to how such evidence should constrain the interpretation of downstream structural results.

More importantly, current methodological guidance provides detailed recommendations for identifying discriminant-validity problems but comparatively limited guidance regarding how researchers should respond after such problems have been detected. Existing diagnostics answer the question of whether construct redundancy exists, yet provide far less direction regarding how construct redundancy should alter the interpretation of structural coefficients, mediation effects, and managerial rankings. Consequently, empirical studies may continue to compare standardized path coefficients and identify "the most important" marketing drivers despite evidence that the constructs being compared are not empirically distinguishable.

This disconnect reflects a broader separation between measurement evaluation and structural interpretation within current PLS-SEM practice. Measurement diagnostics are often treated as procedural requirements, whereas substantive conclusions are interpreted largely independently of the diagnostic evidence that precedes them. We argue that these two stages should instead be explicitly connected through a sequential logic: failure to establish construct distinctiveness should constrain, and in some cases invalidate, subsequent causal interpretation.

Accordingly, the following sections distinguish the two principal mechanisms through which construct redundancy arises and demonstrate the characteristic empirical signature that these mechanisms generate in integrated SMM models. Building upon this theoretical foundation, we subsequently propose a sequential diagnostic protocol that reconnects measurement evaluation with structural interpretation.

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3. Two Mechanisms of Construct Redundancy

3.1 Construct Redundancy Is Not a Single Phenomenon

Construct redundancy is often discussed as though it represents a single methodological problem characterised by high inter-construct correlations or inadequate discriminant validity. Recent methodological work continues to treat discriminant validity as a key criterion for judging whether conceptually similar constructs can be empirically distinguished (Cheung et al., 2023). However, high empirical associations between latent constructs may arise from fundamentally different underlying mechanisms. Treating all cases of construct redundancy as equivalent risks both theoretical oversimplification and inappropriate methodological remedies. Recent construct-validation studies show that high latent correlations may sometimes indicate construct overlap, but in other cases may reflect theoretically related yet still distinguishable constructs (Panzeri et al., 2024).

In particular, construct redundancy may emerge because two constructs are conceptually and operationally indistinguishable, or because theoretically different constructs become empirically inseparable within a particular research context. Although both mechanisms generate similar statistical symptoms−including excessive correlations, discriminant-validity failure, and unstable structural coefficients−their theoretical origins are fundamentally different. The former reflects deficiencies in construct operationalisation, whereas the latter reflects the convergence of multiple theoretical mechanisms upon a shared underlying evaluation.

Distinguishing these mechanisms is important because they imply different responses. Literal overlap primarily requires improvements in construct development and measurement design, whereas common-cause entanglement calls for greater attention to theoretical specification, research design, and the interpretation of structural relationships. Accordingly, we distinguish two mechanisms through which construct redundancy may arise in integrated SMM models.

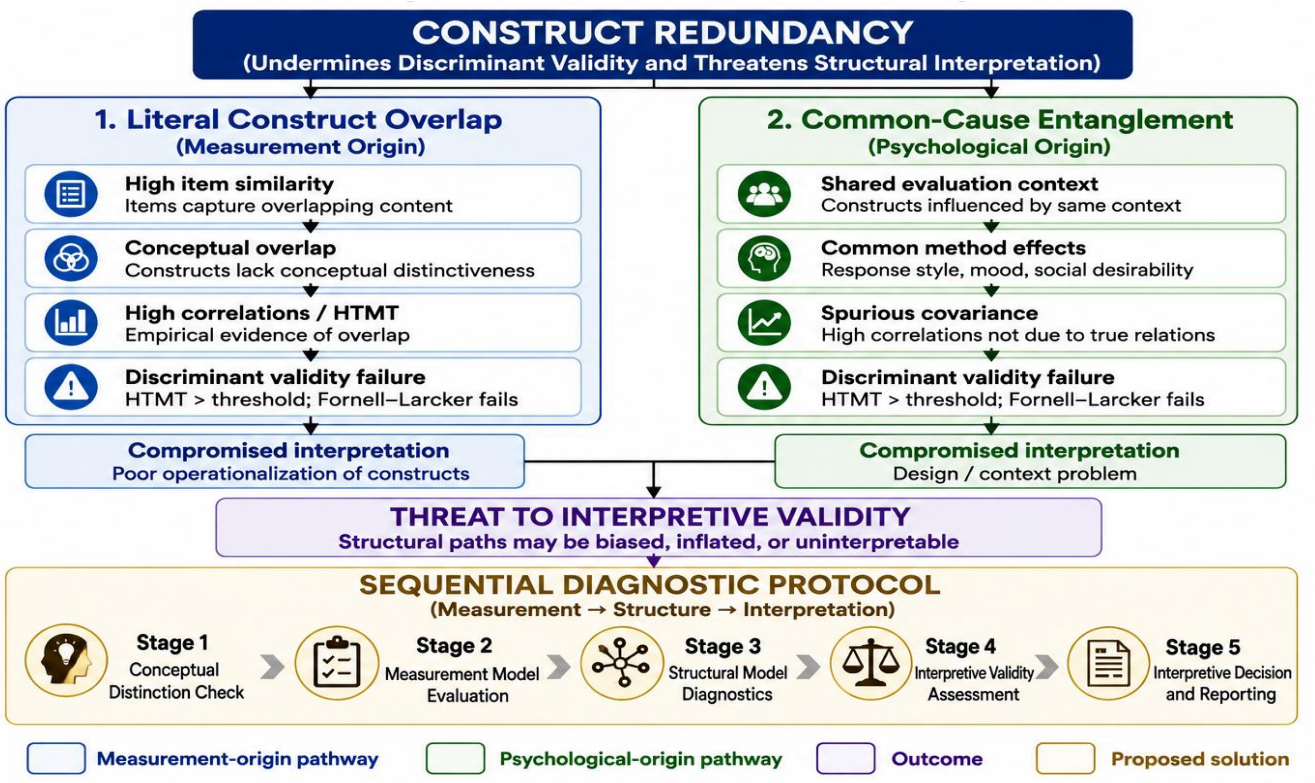

Figure 1. Construct Redundancy Framework: Two Pathways to Threaten Structural Interpretation

As illustrated in Figure 1, construct redundancy can arise from either literal construct overlap or common-cause entanglement. Although these mechanisms originate from different sources, both ultimately undermine construct distinctiveness and threaten the interpretability of structural coefficients.

3.2 Mechanism I: Literal Construct Overlap

The first mechanism arises when different constructs are operationalised using indicators that measure essentially the same conceptual content. Although the constructs carry different theoretical labels, respondents may perceive little meaningful distinction among their measurement items. This phenomenon corresponds closely to the jingle-jangle fallacy, in which different labels may refer to similar constructs or similar labels may refer to different construct meanings (Hanfstingl et al., 2025).

Integrated SMM models appear particularly susceptible to this problem because many constructs are operationalised using positively valenced evaluative statements. For example, indicators measuring SMM strategy often describe social media activities as effective, well-designed, or engaging, whereas perceived usefulness is measured through statements describing social media marketing as beneficial, useful, or capable of improving performance. Although these constructs originate from different theoretical traditions, respondents may interpret them as alternative expressions of a common positive evaluation of social media marketing. Similar problems have been documented in consumer-brand relationship research, where multiple relational constructs were found to overlap substantially because their scales often

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assessed highly similar or synonymous ideas (Albert & Thomson, 2024).

Under these circumstances, high inter-construct correlations are partly designed into the measurement instrument itself. Respondents need not distinguish between theoretical concepts because the questionnaire does not require them to do so. Instead, a favourable evaluation of social media marketing naturally produces consistently positive responses across multiple construct scales. The resulting construct redundancy therefore reflects limitations in construct operationalisation rather than genuine psychological relationships. Recent work on content validity similarly warns that item overlap and ambiguous construct definitions can undermine the usefulness of self-report scores and the validity of subsequent inferences (Goecke et al., 2025).

This mechanism has important methodological implications. Because redundancy originates from the measurement instrument, statistical remedies applied after data collection cannot fully resolve the problem. Construct distinctiveness must instead be established before empirical analysis through careful conceptual development, independent expert judgement, and procedures that evaluate whether measurement items can be reliably assigned to their intended constructs. Recent methodological work suggests that semantic analysis and expert deliberation can help identify overlapping construct definitions and improve conceptual clarity before empirical testing begins (Wulff & Mata, 2025). If respondents or independent experts cannot consistently distinguish between item pools, subsequent statistical evidence of discriminant validity should be interpreted with considerable caution.

3.3 Mechanism II: Common-Cause Entanglement

Unlike literal construct overlap, which originates from deficiencies in construct operationalisation, common-cause entanglement arises from shared psychological evaluations or methodological conditions rather than from the measurement instrument itself. As illustrated in Figure 2, the root problem is not that different constructs are poorly defined, but that theoretically distinct constructs become empirically inseparable because they are influenced by the same underlying evaluative context.

Dimension	1. Literal Overlap (Measurement Origin)	2. Common-Cause Entanglement (Psychological Origin)
Source of Redundancy	Items are highly similar in content; overlap occurs at the measurement level.	Constructs are influenced by the same evaluation context or common causes.
Nature of Redundancy	Redundancy arises from conceptual and operational overlap.	Redundancy arises from spurious covariance due to shared underlying factors.
Typical Empirical Indicators	• Very high inter-construct correlations • HTMT > 0.90 • Fornell–Larcker criterion failure • Poor discriminant validity	• Very high correlations across constructs • HTMT > 0.90 • High VIF, multicollinearity, suppression effects • Poor discriminant validity
Root Problem	Constructs are insufficiently distinct; items capture overlapping concepts.	Research design or context induces spurious associations.
Primary Remedy	Refine construct definitions and items; improve conceptual distinctiveness and measurement design.	Improve research design and data quality; use multi-source data, temporal separation, or experimental / behavioral measures.
Impact on Interpretation	Threatens the distinctiveness of constructs, making paths overlapping and unstable.	Threatens causal attribution, inflating or biasing path estimates.
Key Implication	The problem lies in the measurement itself; solve it at the construct and item level.	The problem lies in the research context and methods; solve it at the design and data level.

Note: Although these two mechanisms originate from different sources, both lead to construct redundancy, which undermines discriminant validity and threatens the interpretation of structural relationships.

Figure 2. Construct Redundancy: Comparison of Two Mechanisms

Within integrated social media marketing (SMM) models, constructs such as perceived usefulness, brand trust, social influence, and purchase intention may all reflect consumers' overall favourability toward a brand or its social media presence. Although each construct represents a distinct theoretical concept, respondents with generally favourable attitudes are likely to provide consistently positive evaluations across these constructs. Consequently, high correlations emerge not because the measurement items capture identical concepts, but because multiple constructs originate from a shared underlying psychological evaluation.

The problem is further amplified when all variables are collected simultaneously from the same respondents using self-report questionnaires. Under such single-source, cross-sectional survey designs, common-method variance, response styles, acquiescence, and general evaluative consistency may artificially inflate correlations among theoretically distinct constructs (Podsakoff et al., 2024). As a result, empirical associations increasingly reflect shared contextual influences rather than genuinely independent theoretical mechanisms.

Accordingly, the primary remedy differs fundamentally from that for literal construct overlap. Revising questionnaire items alone is unlikely to resolve this form of redundancy because the source of the problem lies in the research design rather than the measurement instrument. More appropriate solutions include multi-source data collection, longitudinal or time-separated designs, behavioural indicators, experimental manipulation, and external validation through nomological networks, all of which help disentangle shared contextual influences from genuine causal relationships (Arista et al., 2024). Longitudinal evidence is particularly valuable because it can reduce common method bias, strengthen temporal ordering, and improve the basis for causal interpretation in scale validation and structural modelling (So et al., 2025).

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Although literal construct overlap and common-cause entanglement originate from fundamentally different sources, they ultimately produce remarkably similar empirical manifestations, including excessively high inter-construct correlations, poor discriminant validity, multicollinearity, and unstable structural coefficients. As summarised in Figure 2, similar statistical symptoms may arise from fundamentally different theoretical mechanisms, implying that accurate diagnosis of the underlying source must precede methodological remediation. The following section demonstrates how these different mechanisms converge into a common empirical signature that should be recognised before substantive structural interpretation proceeds.

4. Empirical Signature of Construct Redundancy

4.1 From Theoretical Mechanisms to Empirical Patterns

The preceding section distinguished two mechanisms through which construct redundancy may arise: literal construct overlap and common-cause entanglement. Although these mechanisms originate from different theoretical sources, they ultimately converge on a common empirical consequence: the loss of construct distinctiveness and the progressive destabilisation of structural interpretation. The value of distinguishing these mechanisms therefore lies not only in explaining why construct redundancy occurs, but also in predicting how it manifests itself empirically.

As illustrated in Figure 3, construct redundancy should not be diagnosed using any single statistical indicator. High inter-construct correlations, poor discriminant validity, elevated multicollinearity, or unstable structural coefficients may each occur independently for reasons unrelated to construct redundancy. For example, high correlations may simply reflect theoretically related constructs, while an isolated failure of the Fornell‑Larcker criterion does not necessarily invalidate an entire structural model. Consequently, individual statistics should be interpreted as diagnostic signals rather than definitive evidence.

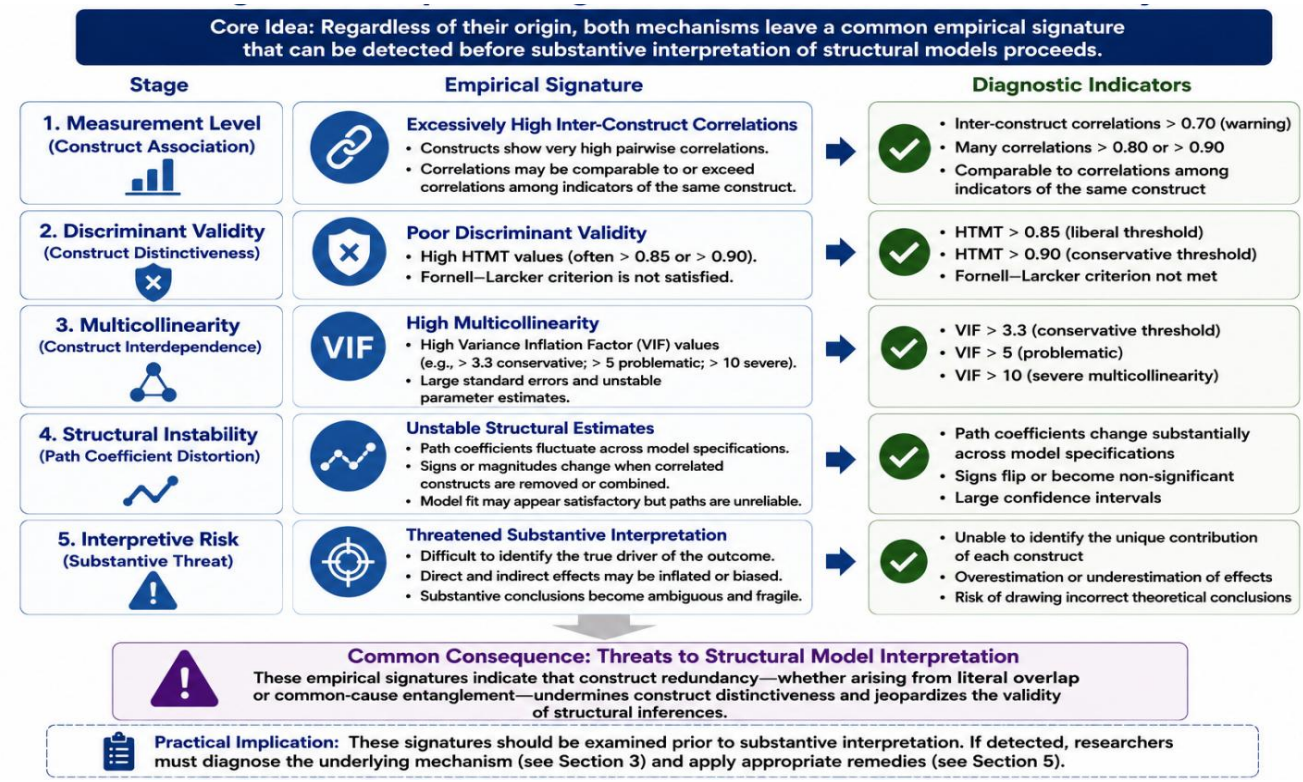

Figure 3. Empirical Signature of Construct Redundancy

Instead, construct redundancy is best understood as a pattern of converging empirical evidence. Figure 3 illustrates this progression as a sequence of increasingly informative empirical manifestations. At the measurement level, redundant constructs exhibit excessively high inter-construct correlations and insufficient discriminant validity, indicating a loss of empirical distinctiveness. As these problems propagate into the structural model, they are reflected in elevated multicollinearity, unstable parameter estimates, suppression effects, and inconsistent structural relationships. Collectively, these empirical manifestations increase the risk that statistically significant paths no longer represent genuinely independent theoretical mechanisms.

Accordingly, the empirical signature of construct redundancy comprises two complementary dimensions. The first concerns the loss of construct distinctiveness within the measurement model, while the second concerns structural instability within the structural model. Neither dimension alone provides conclusive evidence; rather, meaningful diagnosis depends on the convergence of evidence across multiple indicators. The following sections examine these two dimensions in detail before illustrating how they jointly emerge in an empirical case.

4.2 Signature I: Loss of Construct Distinctiveness

The first empirical manifestation of construct redundancy appears within the measurement model. Because redundant constructs fail to represent empirically distinct theoretical concepts, they exhibit unusually strong correlations that exceed accepted standards of discriminant validity. The most direct evidence therefore comes from indicators designed to evaluate construct distinctiveness,

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particularly the Fornell‑Larcker criterion and the heterotrait‑monotrait ratio (HTMT) (Li & Lay, 2024).

When correlations between constructs approach or exceed the square root of their average variance extracted (AVE), or when HTMT values approach unity, the measurement model provides evidence that theoretically different constructs cannot be empirically distinguished. Such findings should not be interpreted merely as isolated measurement deficiencies but as indicators that multiple latent variables may represent overlapping evaluations of the same underlying phenomenon.

Importantly, satisfactory reliability and convergent validity do not offset this problem. High Cronbach's alpha, composite reliability, or AVE demonstrate that indicators consistently measure their intended construct, but they do not demonstrate that different constructs measure different phenomena (Cheung et al., 2023). Consequently, it is entirely possible for redundant constructs to exhibit excellent internal consistency while simultaneously failing discriminant validity.

4.3 Signature II: Structural Instability

Construct redundancy also leaves a characteristic signature within the structural model. Once highly overlapping constructs are entered simultaneously as predictors, structural estimation becomes increasingly unstable because multiple latent variables compete to explain essentially the same variance in the outcome variable. The resulting instability may manifest itself in several related forms.

First, excessive multicollinearity inflates standard errors and increases the sensitivity of standardized path coefficients to minor changes in model specification (Haji-Othman et al., 2024). In severe cases, standardized coefficients may exceed one, indicating that suppression effects rather than substantive relationships are driving the estimation process.

Second, mediation analysis becomes difficult to interpret because predictors and mediators are themselves insufficiently distinguishable. Although statistically significant indirect effects may still be reported, inconsistencies frequently emerge between reported path coefficients and calculated indirect effects. Such discrepancies suggest that mediation results are unstable rather than theoretically meaningful(S. & T., 2025).

Third, apparently excellent model performance may itself become diagnostically informative. Extremely high coefficients of determination, exceptionally large effect sizes, or near-perfect correlations between theoretically distinct constructs should prompt researchers to consider whether the model reflects genuine explanatory power or whether construct redundancy, common-method variance, or data-specification problems have inflated the observed relationships (Podsakoff et al., 2024).

Taken together, these indicators suggest that construct redundancy should not be diagnosed from measurement statistics alone. Instead, evidence from the measurement model and the structural model should be interpreted jointly because both reflect different manifestations of the same underlying problem.

4.4 Illustrating the Empirical Signature

To illustrate the converging empirical signature proposed in Figure 3, we revisit the authors' companion empirical study examining the effects of social media marketing on purchase intention among consumers in Beijing (n = 384). The purpose of this illustrative case is not to demonstrate the prevalence of construct redundancy, but rather to show how evidence from both the measurement model and the structural model converges toward the same interpretive conclusion. Consistent with the framework developed in the preceding sections, no single statistic is regarded as decisive; instead, construct redundancy is inferred from the convergence of multiple complementary diagnostic indicators.

At the measurement level, the reproduced Fornell‑Larcker matrix provides clear evidence of insufficient construct distinctiveness. As shown in Table 1, five of the seven latent constructs—including the dependent variable—fail the Fornell‑Larcker criterion. Specifically, Perceived Usefulness (PU), Brand Trust (BT), Social Influence (SI), Social Media Marketing (SMM), and Purchase Intention (PInt) exhibit correlations that exceed the square roots of their respective average variance extracted (AVE) values. These results indicate that the constructs are empirically insufficiently differentiated, corresponding to the first stage of the empirical signature illustrated in Figure 3.

Table 1. Illustrative Evidence of Construct Redundancy: Reproduced Fornell‑Larcker Matrix

	BT	EoU	PU	PInn	PInt	SI	SMM
Brand Trust (BT)	0.875						
Ease of Use (EoU)	0.537	0.815					
Perceived Usefulness (PU)	0.934	0.488	0.798				
Personal Innovativeness (PInn)	0.818	0.603	0.747	0.821			
Purchase Intention (PInt)	0.979	0.639	0.906	0.796	0.841		
Social Influence (SI)	0.983	0.591	0.911	0.797	0.985	0.834	
Social Media Marketing (SMM)	0.982	0.629	0.909	0.796	1.000	0.986	0.841

Evidence from the structural model further reinforces this diagnosis. Consistent with the second dimension of the empirical signature shown in Figure 3, the estimated structural relationships exhibit multiple indicators of structural instability. Standardised path coefficients become implausibly large, including coefficients exceeding unity, while reported mediation effects cannot be fully reconciled with the corresponding direct effects from which they should theoretically be derived. The model also reports exceptionally high explanatory power and near-perfect correlations among theoretically distinct constructs, suggesting that the estimated structural relationships are influenced by redundancy rather than by genuinely independent theoretical mechanisms. Collectively, these observations correspond to the structural instability stage of the proposed empirical signature.

Taken together, the measurement and structural evidence forms a pattern of converging empirical evidence, rather than a collection

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of isolated methodological anomalies. Although no individual statistic can conclusively establish the existence or origin of construct redundancy, the simultaneous presence of poor discriminant validity, excessively high inter-construct correlations, unstable parameter estimates, and implausible structural relationships provides strong support for the interpretive concerns identified throughout this study. According to the Interpretive Validation Framework (Figure 4), such evidence should prompt researchers to qualify substantive interpretations and reconsider construct specification before drawing conclusions regarding causal mechanisms or managerial implications.

5. From Measurement Diagnosis to Structural Interpretation

The preceding sections have argued that construct redundancy arises through different theoretical mechanisms and leaves a recognisable empirical signature within both the measurement and structural models. These findings raise a more fundamental question than how construct redundancy should be detected: How should evidence of construct redundancy change the interpretation of structural relationships?

Current reporting practice implicitly assumes that measurement evaluation and structural interpretation are two largely independent stages of structural equation modelling. Researchers first assess reliability and validity, then estimate structural relationships, and finally interpret standardized path coefficients as evidence of theoretical mechanisms and managerial priorities. In practice, however, these stages are inseparable. Evidence that latent constructs are not empirically distinguishable necessarily constrains the interpretation of the structural coefficients linking those constructs.

Accordingly, this section argues that construct redundancy should not simply trigger additional measurement diagnostics. Rather, it should redefine the boundary within which structural interpretation remains defensible. We therefore distinguish between statistical significance and interpretive validity, and argue that structural coefficients should be interpreted only after construct distinctiveness has been adequately established.

5.1 Why Significant Paths Can Be Misleading

Within PLS-SEM research, statistically significant structural coefficients are frequently interpreted as evidence that one theoretical construct exerts an independent influence upon another. Such interpretations are justified only if the latent constructs themselves represent empirically distinguishable theoretical concepts. When construct redundancy exists, however, statistical significance alone provides insufficient evidence for independent causal interpretation.

Highly correlated predictors share substantial proportions of variance. During model estimation, this shared variance must be allocated among competing predictors, causing standardized coefficients to become sensitive to model specification, indicator composition, and estimation procedures. Consequently, statistically significant coefficients may reflect statistical partitioning rather than genuinely independent theoretical mechanisms.

This distinction is particularly important because statistical significance addresses the probability that an estimated coefficient differs from zero, whereas construct redundancy concerns whether the coefficient represents a unique explanatory process. A statistically significant coefficient therefore does not necessarily imply that the corresponding construct contributes independently to the outcome variable.

Construct redundancy thus challenges the common assumption that significance automatically implies theoretical importance. Instead, structural coefficients should be interpreted as meaningful evidence of causal mechanisms only after construct distinctiveness has been demonstrated.

5.2 Why Marketing Levers Cannot Always Be Ranked

One of the principal managerial contributions claimed by integrated SMM studies is the identification of the "most important" marketing driver. Researchers commonly compare standardized path coefficients and recommend that practitioners allocate resources toward constructs exhibiting the largest effects (Salhab et al., 2023).

Such comparisons, however, implicitly assume that each coefficient represents the unique influence of an independent marketing lever. When construct redundancy is present, this assumption no longer holds. Highly correlated constructs compete to explain overlapping variance, causing estimated coefficients to depend upon how shared variance is statistically allocated rather than upon genuine differences in theoretical influence.

Accordingly, rankings derived from redundant constructs should be interpreted with considerable caution. The issue is not that standardized coefficients become mathematically incorrect, but that their substantive meaning changes. Rather than representing independent managerial priorities, they increasingly reflect estimation outcomes contingent upon model specification.

This distinction is especially important for applied marketing research. Recommendations regarding resource allocation, campaign design, or strategic priorities should not be based solely upon coefficient magnitude when the underlying constructs cannot first be demonstrated to be empirically distinct.

5.3 Structural Interpretation Should Be Conditional

The discussion above suggests that structural interpretation should not be regarded as an automatic consequence of model estimation. Instead, it should be viewed as conditional upon the successful completion of a series of measurement evaluations.

Current methodological practice often treats measurement diagnostics as procedural checkpoints that precede structural analysis. Once these diagnostics have been reported, subsequent interpretation typically proceeds regardless of whether some criteria have only marginally been satisfied or have been partially violated. We argue that this practice underestimates the interpretive implications of construct redundancy.

Specifically, evidence of insufficient construct distinctiveness should constrain the interpretation of downstream results. When discriminant validity fails, claims regarding relative importance, mediation mechanisms, and independent causal effects should be regarded as provisional rather than definitive. Researchers may still report statistical estimates, but those estimates should not be interpreted as evidence supporting distinct theoretical mechanisms until construct redundancy has been adequately addressed.

In other words, measurement evaluation should function not merely as a statistical quality assessment but as an interpretive

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gatekeeper that determines whether structural conclusions are warranted.

5.4 Toward an Interpretive Logic for Integrated PLS-SEM Models

The arguments developed throughout this chapter suggest a shift in how integrated PLS-SEM models should be interpreted. Rather than viewing measurement assessment and structural estimation as two separate analytical stages, they should be understood as components of a single sequential reasoning process. Evidence generated during measurement evaluation establishes the conditions under which subsequent structural interpretation remains valid.

This perspective has important implications for methodological practice. The objective is not to reject structural models whenever construct redundancy is detected, but to ensure that substantive conclusions remain consistent with the quality of the underlying measurement evidence. Structural coefficients should therefore be interpreted within clearly defined evidential boundaries established by construct distinctiveness.

Accordingly, we propose that integrated SMM models should adopt a sequential diagnostic logic in which evidence of construct redundancy determines whether downstream structural interpretation is justified. The following section operationalises this principle by presenting a diagnostic protocol that connects measurement evaluation, structural diagnosis, and substantive interpretation into a unified analytical framework.

6. A Sequential Diagnostic Protocol

6.1 Design Principles of the Protocol

The preceding chapters argue that construct redundancy should not be regarded solely as a measurement problem but as a constraint on structural interpretation. This perspective implies that diagnostic procedures should be organised according to the logic of scientific inference rather than as a collection of independent statistical checks. Accordingly, we propose a sequential diagnostic protocol that links measurement evaluation directly to the interpretation of structural relationships.

The protocol is guided by three principles. First, diagnostics should be sequential rather than parallel. Evidence obtained at one stage determines whether subsequent analyses remain interpretable. A failure to establish construct distinctiveness should therefore constrain downstream interpretation rather than simply being reported as another statistical result.

Second, diagnostics should be interpretation-oriented rather than statistic-oriented. Conventional reporting often treats reliability, validity, and collinearity as procedural requirements. In contrast, the proposed protocol treats each diagnostic stage as evidence for determining whether substantive conclusions are warranted.

Third, diagnostics should distinguish between different sources of construct redundancy. As argued in the previous chapter, redundancy arising from literal construct overlap requires different methodological responses from redundancy generated through common-cause entanglement. The protocol therefore emphasises diagnosis before remediation rather than prescribing identical solutions for all cases.

6.2 The Sequential Diagnostic Protocol

Figure 4 presents the proposed Interpretive Validation Framework (IVF), which integrates conceptual specification, measurement evaluation, structural diagnosis, interpretive validation, and transparent reporting into a unified sequential process. Unlike conventional PLS-SEM reporting practices that often treat reliability, validity, and structural analysis as relatively independent analytical tasks, the IVF conceptualises structural interpretation as the final outcome of a cumulative evidence-building process. Progression to each stage depends upon satisfactory evidence obtained from the preceding stage, reflecting the central argument of this study that meaningful structural interpretation is justified only when construct distinctiveness has been established and structural stability has been demonstrated.

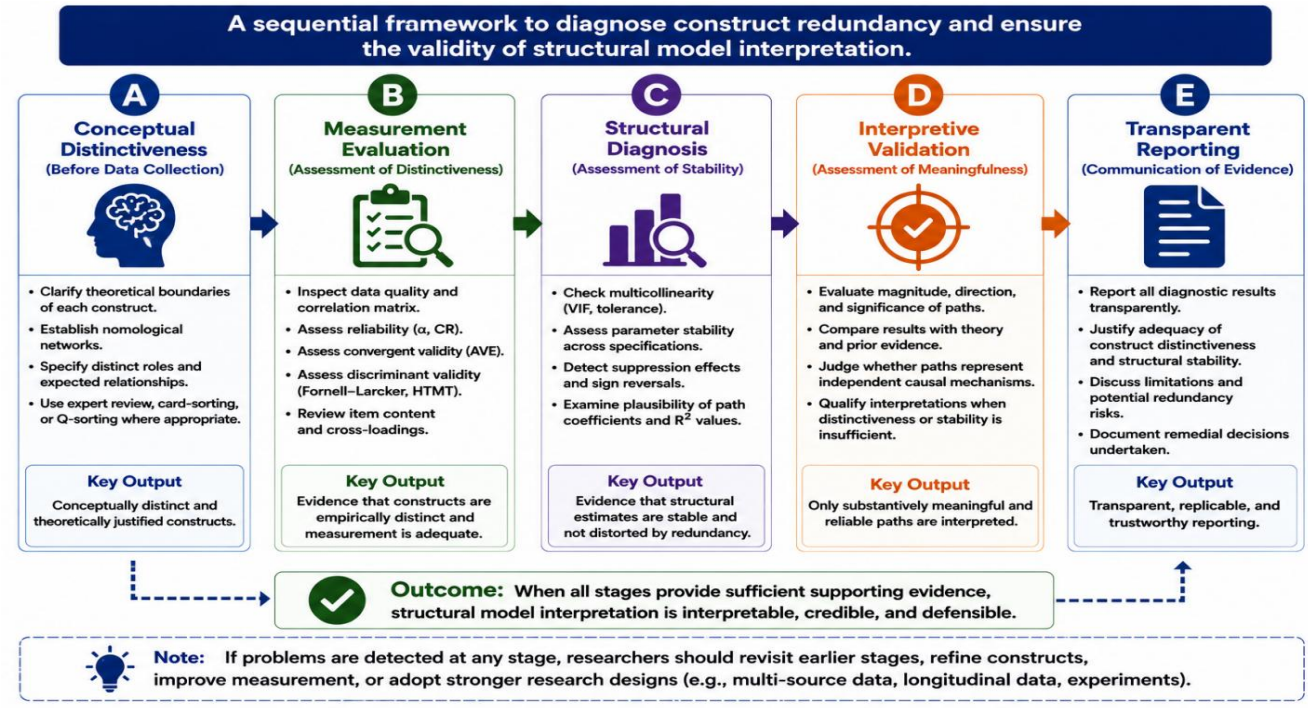

Figure 4. The Interpretive Validation Framework (IVF)

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Stage A: Conceptual Distinctiveness

The framework begins before data collection, recognising that construct redundancy often originates during model conceptualisation rather than during statistical estimation. Researchers should establish clear conceptual boundaries for each construct through rigorous construct definition, expert review, and, where appropriate, card-sorting or Q-sorting procedures. Nomological relationships and theoretical roles should also be explicitly specified to ensure that each construct represents a unique conceptual domain. As shown in Figure 4, the primary outcome of this stage is a conceptually coherent and theoretically defensible measurement model. Statistical analyses conducted later cannot compensate for inadequate construct conceptualisation.

Stage B: Measurement Evaluation

After data collection, attention shifts to evaluating whether empirical evidence supports the proposed conceptual distinctions. Before conducting conventional reliability and validity analyses, researchers should examine data quality, including unusually high inter-construct correlations, duplicated indicators, and potential specification problems. Reliability (Cronbach's α and composite reliability), convergent validity (AVE), and discriminant validity (Fornell–Larcker criterion and HTMT) should then be assessed according to current methodological recommendations. Item content and cross-loadings should also be reviewed to determine whether insufficient construct distinctiveness reflects measurement deficiencies rather than theoretical overlap. Successful completion of this stage provides empirical evidence that the measurement model adequately differentiates the proposed constructs.

Stage C: Structural Diagnosis

Only after construct distinctiveness has been supported should structural relationships be interpreted. At this stage, the objective extends beyond evaluating explanatory power to examining the stability of structural estimation. Researchers should inspect inner-model multicollinearity (VIF), suppression effects, implausible standardized coefficients, unstable mediation estimates, and unusually high coefficients of determination. As illustrated in Figure 4, these complementary diagnostics indicate whether structural coefficients represent genuinely independent theoretical mechanisms or are distorted by construct redundancy. The key outcome of this stage is evidence regarding the stability and credibility of structural estimation.

Stage D: Interpretive Validation

A central contribution of the proposed framework is the explicit separation of model estimation from model interpretation. Statistical significance alone does not justify substantive interpretation. Instead, researchers should evaluate whether structural coefficients remain theoretically meaningful after considering evidence accumulated during the previous stages. Path magnitude, direction, mediation effects, and managerial implications should therefore be interpreted only when sufficient evidence supports both construct distinctiveness and structural stability. When redundancy remains unresolved, substantive conclusions should be explicitly qualified, and claims regarding causal importance or construct prioritisation should be treated as provisional rather than definitive.

Stage E: Transparent Reporting

The final stage concerns the transparent communication of diagnostic evidence. Rather than suppressing evidence of construct redundancy, researchers should report diagnostic results, justify remedial decisions, discuss remaining interpretive limitations, and explain how these limitations affect substantive conclusions. Transparent reporting enables reviewers and readers to evaluate whether theoretical interpretations remain consistent with the underlying evidence and enhances the credibility, reproducibility, and cumulative development of PLS-SEM research.

Finally, the IVF should not be regarded as a rigid procedural checklist but as an iterative validation framework. Evidence obtained during later stages may require researchers to revisit earlier decisions regarding construct conceptualisation, measurement specification, or model design. Consequently, interpretive validity is achieved not through any single statistical criterion but through the convergence of conceptual, measurement, structural, and reporting evidence across the entire analytical process.

6.3 Interpretation Rules

The protocol proposed here differs from existing reporting standards because it introduces explicit interpretive decision rules rather than merely additional diagnostic statistics. These rules are summarised as follows.

Rule 1. Structural relationships should not be interpreted before conceptual and empirical construct distinctiveness has been demonstrated.

Rule 2. Failure of discriminant validity does not automatically invalidate a study, but it limits the strength of conclusions that can be drawn regarding independent causal mechanisms.

Rule 3. Rankings of standardized path coefficients should be reported only when evidence supports the empirical distinctiveness of the constructs being compared.

Rule 4. Multiple diagnostic indicators should be interpreted collectively rather than independently. No single statistic should determine substantive conclusions.

Together, these rules reposition measurement evaluation as the foundation rather than the preliminary stage of structural interpretation.

6.4 Relationship to Existing PLS-SEM Guidelines

The protocol proposed in this study is intended to complement rather than replace existing methodological standards. Established procedures for evaluating reliability, convergent validity, discriminant validity, predictive performance, and common-method bias remain appropriate and are incorporated throughout the protocol. The present contribution therefore does not lie in introducing new statistical indices.

Instead, the novelty of the protocol lies in its sequencing logic. Existing guidelines specify what researchers should evaluate but provide comparatively limited guidance regarding how evidence from different diagnostic stages should constrain subsequent structural interpretation. By explicitly linking measurement evaluation with structural inference, the proposed protocol transforms a collection of independent statistical diagnostics into a coherent interpretive framework.

7. Implications

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The findings of this study have implications for theory development, methodological practice, and the interpretation of integrated social media marketing (SMM) models. Rather than introducing a new statistical technique, the present study reframes the role of construct distinctiveness within PLS-SEM by demonstrating that measurement evaluation and structural interpretation should be understood as components of a single inferential process. This perspective extends existing methodological guidance while providing researchers with a more coherent framework for interpreting integrated structural models.

7.1 Theoretical Implications

The first contribution of this study is theoretical. Existing SMM research has generally regarded discriminant validity as one element of measurement quality that should be assessed before structural relationships are estimated. Our findings suggest that this perspective is incomplete. Construct distinctiveness should not merely be viewed as a property of measurement models but as a prerequisite for interpreting structural relationships. When theoretically different constructs cannot be empirically distinguished, structural coefficients cannot confidently be interpreted as representing independent causal mechanisms.

This perspective also extends current understanding of integrated SMM models. Previous studies have focused primarily on improving predictive accuracy by incorporating an increasing number of theoretically relevant antecedents into a single explanatory framework. While such integration has enhanced explanatory power, it has also increased the likelihood that conceptually related constructs become empirically entangled. Our analysis suggests that the value of model integration should therefore be balanced against the requirement for construct distinctiveness. Adding more theoretically relevant constructs does not necessarily improve theoretical explanation if those constructs cannot be empirically separated.

More broadly, this study contributes to the methodological literature by distinguishing between measurement validity and interpretive validity. Existing SEM research has devoted considerable attention to evaluating whether constructs satisfy accepted measurement criteria. We argue that an additional level of validity deserves explicit consideration: whether the available measurement evidence justifies substantive interpretation of structural coefficients. This distinction provides a conceptual bridge between construct validation and causal interpretation, encouraging researchers to consider not only whether models are statistically acceptable but also whether their substantive conclusions are epistemically warranted.

7.2 Methodological Implications

The second contribution concerns methodological practice. Rather than proposing new statistical indices, this study reorganises existing diagnostic procedures into a sequential interpretive framework. Current PLS-SEM guidelines provide comprehensive recommendations regarding reliability, convergent validity, discriminant validity, predictive performance, and collinearity assessment. However, these procedures are commonly implemented as independent reporting requirements. Our proposed protocol emphasises their logical dependency by arguing that evidence obtained during measurement evaluation determines whether subsequent structural interpretation remains defensible.

This sequential perspective has important implications for empirical research. First, it encourages researchers to view construct redundancy as a cumulative pattern of evidence rather than as the outcome of any single diagnostic statistic. Construct redundancy should therefore be diagnosed through converging evidence derived from conceptual specification, measurement evaluation, and structural analysis.

Second, the proposed protocol provides greater methodological transparency. Rather than reporting only successful diagnostic outcomes, researchers are encouraged to explicitly discuss how measurement evidence influences the confidence that can be placed in structural conclusions. Such reporting is particularly valuable in studies involving highly correlated psychological constructs, where statistical significance alone may provide an incomplete basis for substantive interpretation.

Finally, the protocol offers a practical framework for reviewers and journal editors. Instead of evaluating measurement and structural models independently, reviewers can assess whether the interpretation of structural relationships is consistent with the quality of the underlying measurement evidence. This approach promotes greater consistency in the methodological evaluation of integrated PLS-SEM studies.

7.3 Practical Implications

Although this study is methodological in nature, it also has practical implications for marketing researchers and practitioners. Integrated SMM models are frequently used to identify the marketing activities that deserve priority in strategic decision-making. Such recommendations influence resource allocation, campaign design, and investment decisions across digital marketing contexts. Our findings suggest that these recommendations should be interpreted cautiously when the underlying constructs exhibit substantial empirical overlap.

For researchers, the proposed protocol provides a systematic framework for evaluating construct distinctiveness before drawing conclusions regarding relative importance or causal influence. Rather than interpreting all statistically significant coefficients as evidence of independent managerial levers, researchers should first establish whether the constructs being compared represent genuinely distinguishable theoretical concepts.

For journal reviewers and editors, the protocol provides a transparent basis for evaluating the credibility of structural interpretations. Evidence of insufficient construct distinctiveness should not necessarily lead to rejection of empirical studies, but it should encourage more cautious interpretation of coefficient rankings, mediation analyses, and theoretical claims.

Finally, software developers and methodological guideline developers may also benefit from the present framework. Contemporary PLS-SEM software has substantially improved the accessibility of advanced statistical diagnostics. Future developments may further support researchers by integrating interpretive decision rules alongside existing diagnostic statistics, thereby helping users distinguish between statistical significance and interpretive validity.

8. Limitations and Future Research

Like all methodological studies, the present research should be interpreted within the scope of its design. Rather than weakening the proposed framework, these boundary conditions indicate where

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additional evidence is needed to evaluate its broader applicability. Future research can therefore extend the present study by examining whether the proposed interpretive framework generalises across different analytical contexts, research designs, and theoretical domains.

8.1 Scope of the Empirical Evidence

The empirical illustration presented in this study is based on a single integrated social media marketing (SMM) model. Although the worked example effectively demonstrates how construct redundancy may manifest itself through converging diagnostic evidence, it is not intended to establish the prevalence of construct redundancy across the broader SMM literature. The illustrative case should therefore be interpreted as a methodological demonstration rather than as evidence that all integrated SMM studies necessarily suffer from construct redundancy.

Future research may strengthen the proposed framework by examining larger collections of published studies through systematic reviews or meta-methodological analyses. Such investigations would enable researchers to estimate how frequently construct redundancy occurs across different research contexts and whether particular model specifications are especially susceptible to redundancy.

8.2 Methodological Boundary Conditions

A second limitation concerns the methodological scope of the proposed protocol. The framework has been developed primarily for reflective measurement models estimated using PLS-SEM because these models dominate contemporary SMM research. Whether similar interpretive principles apply equally to covariance-based SEM, formative measurement models, multilevel SEM, Bayesian SEM, or generalized structural equation modelling remains an open methodological question.

Similarly, the protocol assumes cross-sectional survey data collected through self-report questionnaires, where construct redundancy and common-method variance frequently coexist. Although the proposed interpretive logic is likely to remain relevant in other research settings, its practical implementation may require modification when applied to longitudinal, experimental, behavioural, or multi-source data.

8.3 Generalisability Beyond Social Media Marketing

Although the present study focuses on integrated SMM models, the underlying methodological issue is unlikely to be unique to digital marketing research. Construct redundancy may arise whenever multiple conceptually related latent constructs are estimated simultaneously within complex behavioural models. Similar challenges have been reported in studies of technology acceptance, consumer trust, organisational behaviour, innovation adoption, and information systems research, where theoretically adjacent constructs are frequently incorporated into increasingly comprehensive explanatory frameworks.

Accordingly, future research should investigate whether the interpretive framework proposed here can be generalised beyond the SMM context. Comparative analyses across different research domains may help identify disciplinary characteristics that increase susceptibility to construct redundancy and determine whether the proposed sequential diagnostic logic remains applicable across alternative theoretical settings.

8.4 Future Research Directions

Several avenues for future research emerge from the present study.

First, future methodological research could evaluate the proposed framework using a larger sample of published PLS-SEM studies. Meta-methodological analyses would enable researchers to assess the prevalence of construct redundancy across different disciplines and identify common diagnostic patterns.

Second, future studies may examine whether alternative research designs reduce construct redundancy. Longitudinal data, experimental manipulation, behavioural measures, and multi-source data collection may help disentangle theoretically related constructs that are difficult to distinguish within conventional cross-sectional self-report surveys.

Third, additional methodological work could extend the proposed interpretive framework to other SEM paradigms, including covariance-based SEM, multilevel SEM, Bayesian SEM, and generalized SEM. Such comparisons would clarify whether the proposed interpretive logic reflects a general property of latent-variable modelling or is primarily associated with PLS-SEM applications.

Finally, advances in artificial intelligence provide new opportunities for construct evaluation before empirical data collection. Large language models and other AI-assisted semantic analysis techniques may support researchers in assessing conceptual distinctiveness, identifying overlapping construct definitions, and improving measurement design during the instrument development stage. Exploring how AI-based construct evaluation complements traditional validation procedures represents a promising direction for future methodological research.

9. Conclusion

The rapid development of integrated social media marketing (SMM) models has substantially advanced researchers' ability to explain consumer behaviour by combining multiple theoretical perspectives within a unified analytical framework. However, the increasing integration of behavioural constructs has also introduced an important methodological challenge that has received comparatively limited attention. This study argues that construct redundancy should not be regarded merely as a measurement-quality issue but as a fundamental condition influencing the interpretation of structural relationships. When theoretically different constructs cannot be empirically distinguished, structural coefficients no longer provide unambiguous evidence of independent causal mechanisms, regardless of their statistical significance.

To address this issue, the present study developed a conceptual and methodological framework linking construct redundancy to structural interpretation. We first distinguished two complementary mechanisms through which construct redundancy may arise: literal construct overlap, reflecting insufficient differentiation in construct operationalisation, and common-cause entanglement, reflecting shared underlying evaluations and common-method influences. We then demonstrated that these mechanisms produce a recognisable empirical signature characterised by loss of construct distinctiveness in the measurement model and structural instability in the structural model. Building upon this theoretical foundation, we proposed a sequential diagnostic protocol that reorganises existing diagnostic procedures into an interpretive framework

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connecting conceptual specification, measurement evaluation, structural diagnosis, and substantive interpretation.

The principal contribution of this study does not lie in introducing new statistical indices. Instead, it lies in reframing the relationship between measurement evaluation and structural interpretation. Existing methodological practice has primarily focused on whether measurement models satisfy accepted statistical criteria. We argue that an equally important question concerns whether those measurement results justify the substantive interpretation of structural coefficients. From this perspective, construct distinctiveness becomes not only a characteristic of measurement quality but also an essential prerequisite for causal interpretation. This shift moves the discussion of construct redundancy beyond statistical diagnostics and toward a broader framework of methodological reasoning in structural equation modelling.

More broadly, this study contributes to the continuing development of integrated behavioural models in marketing and information systems research. As researchers increasingly combine constructs from multiple theoretical traditions into comprehensive explanatory frameworks, the challenge of maintaining construct distinctiveness is likely to become more important rather than less. The interpretive framework proposed here therefore seeks not to discourage theoretical integration but to encourage more rigorous conceptualisation, more transparent diagnostic practice, and more cautious structural interpretation. In this sense, construct redundancy should not be viewed simply as a methodological flaw to be corrected after analysis, but as a theoretical issue that deserves attention throughout the entire research process—from construct development and measurement design to empirical estimation and substantive interpretation.

Ultimately, the central message of this study is straightforward: before researchers interpret structural relationships, compare standardized coefficients, or rank managerial priorities, they must first establish that the constructs being compared are empirically distinguishable. Statistical significance may indicate that a relationship exists, but only construct distinctiveness determines whether that relationship can be meaningfully interpreted as evidence of an independent theoretical mechanism.

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