SOCIAL ENGAGEMENT IN FITNESS WEARABLE USE: RECONCEPTUALIZING SOCIAL SHARING AND SOCIAL COMPETING THROUGH AFFORDANCE ACTUALIZATION

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ABSTRACT

Social sharing and social competing are widely treated as distinct constructs in fitness wearable research, reflecting the discrete feature architectures of modern wearable platforms. This paper challenges that assumption by drawing on affordance-actualization theory, which holds that the structure of enacted user behavior is shaped by user goals and interaction contexts rather than by technology feature categories. When multiple affordances serve a common motivational purpose, they actualize as a unified behavioral bundle rather than separate behaviors. The observed pattern supports that sharing activity data and competing with peers constitute such a bundle in the fitness wearable context and introduces Social Engagement (SENG) as a proposed reconceptualized construct capturing this unified enactment. Drawing on data from 1,028 users of fitness wearables and applying affordance-actualization theory, we report that social sharing and social competing items may be empirically difficult to distinguish. We examine whether it may also reflect theoretically meaningful convergence in how these social behaviors are enacted in fitness-wearable use. Users actualize social affordances of fitness wearables as an integrated behavioral disposition. We provide an empirical and theoretical basis for this reconceptualization, thus extending the affordance-actualization framework by demonstrating that insufficient discriminant validity may signal construct-level bundling rather than measurement error.

Keywords: Social Sharing, Social Competing, Social Engagement (SENG), Competing Models Analysis, Affordance-Actualization, Social Comparison, Self-Determination

INTRODUCTION

Fitness wearable technologies (FWTs) have become the fastest-growing consumer health-related technologies (IDC, 2024; Sharma et al., 2024). These devices converge individual health-tracking capabilities, including step counting, heart-rate monitoring, sleep analysis, goal management, and performance feedback, along with social features that enable users to share achievements and compete with peers. Advanced analytics and AI algorithms enable contemporary platforms from Apple, Fitbit, and Samsung to integrate social functionality, including activity sharing, peer challenges, leaderboards, and encouragement feeds. These social capabilities are not peripheral add-ons, rather, they represent a deliberate design strategy based on evidence that interpersonal interaction sustains physical activity over time (Beckett et al., 2025; Kidman et al., 2024; Sharma et al., 2024). For Information Systems (IS) researchers, this poses an important measurement challenge, that is, how should the social dimension of wearable use be operationalized as a construct for structural modeling?

Extant IS and health-informatics literature have treated *social sharing* (dissemination of personal fitness data and achievements) and *social competing* (engaging in goal-directed performance

challenges with peers) as theoretically and empirically distinct constructs (Suh & Li, 2022; Venkatesh et al., 2003; Venkatesh et al., 2012; Zhu et al., 2017). This distinction appears conceptually reasonable. *Sharing* is disclosure-oriented, while *competing* is performance-oriented and has informed separate hypothesis paths in wearable adoption models (Zhu et al., 2017). However, this separation rests on an assumption that users experience these two behaviors as distinct. Limited wearable literature has subjected the sharing–competing distinction to discriminant validity testing, particularly in post-adoption continuance and habit formation models.

This assumption may also distort the technological architecture of wearable platforms. Social sharing and competing features are not presented to users as separate modules. They are co-located in the same interface pathways, activated by the same goal-directed actions, and embedded in overlapping social networks. For example, a user posting workout data simultaneously broadcasts performance for social scrutiny and feeds the data infrastructure that enables competitive rankings. If users enact these features as a unified behavioral episode rather than as distinct activities, modeling them as separate constructs may produce both a measurement and theoretical misspecification issue. We investigated this directly in this study by examining social sharing and social competing and testing their influence on habit formation in the model.

When we estimated a structural model of fitness-wearable continuance, social sharing, and competing, the criterion for discriminant validity was insufficient. The Heterotrait-Monotrait (HTMT) ratio between the two constructs substantially exceeded the conservative threshold (Henseler et al., 2014). The inter-construct correlation exceeded both constructs' square roots of average variance extracted (AVE), and both constructs registered inner-model variance inflation factor (VIF) values indicative of multicollinearity in their joint prediction of habitual use (Hair et al., 2019; Hair Jr et al., 2021). The two constructs were, in Henseler et al. (2014)’s terms, empirically indistinguishable.

Although the findings provide empirical results for questioning the separate existence of these two constructs, we also found some support in the literature. The observed lack of discriminant validity may reflect theoretically meaningful convergence between social sharing and social competing rather than measurement error alone. We present three converging theoretical perspectives (in addition to the empirical justification) to explain why *sharing* and *competing* would be empirically inseparable for wearable users, and the literature should account for this.

First, the affordance-actualization framework (Markus & Silver, 2008; Strong et al., 2014) highlights that technology affordances exist as bundles. In wearable ecosystems, social sharing features and competitive challenge features are co-located in the same interface pathways, triggered by the same goal-oriented actions (e.g., user posting their workout data), and actualized jointly as part of a single interpersonal engagement episode. Treating them as discrete affordances misrepresents the technological architecture.

Second, social comparison theory (Festinger, 1954) provides a deeper motivational explanation. Both *sharing* and *competing* are expressions of the same fundamental behaviors, i.e., comparative self-evaluation against relevant others. Sharing one's performance publicly invites comparison, and competing formalizes it. The underlying psychological motive is similar, and it is this shared motivational substrate, not measurement error, that suggests reconceptualizing the constructs.

Third, self-determination theory (Ryan & Deci, 2000) identifies relatedness and competence as universal psychological needs that motivate interpersonal behavior. In the fitness wearable context, both sharing (satisfying relatedness through affiliation and visibility) and competing (satisfying competence through performance benchmarking) fulfill these needs as an integrated behavioral orientation rather than as separable activities.

Social Engagement (SENG) is proposed as an integrated reconceptualization of social sharing and social competing in the fitness-wearable context, defined as an integrated behavioral pattern through which the users of fitness wearable devices actualize social affordances by sharing performance data with and competing against others within their social network. SENG is distinguished from three adjacent constructs, i.e., social influence, social encouragement, and social capital, that appear in the relevant literature.

One, SENG differs from social influence as conceptualized in the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), which captures normative perceptions of what important others think one should do, a cognitive belief construct, not a behavioral one.

Two, it differs from social encouragement, a one-directional supportive sub-dimension of social affordances (receiving motivation from peers) that does not encompass the active, bidirectional participation captured by SENG. Social encouragement captures a unidirectional experience, i.e., users passively receive motivational signals from peers, such as congratulations or cheering, rather than actively engaging with social features. Suh and Li (2022) illustrate this distinction in the fitness technology context, treating social support as an external input that influences user well-being rather than a behavior that users themselves enact. SENG is fundamentally different. It captures what users actively do with social affordances, involving sharing performance data and competing with others. Both of which require initiating outward actions while simultaneously receiving social feedback. This bidirectional dynamic reflects Festinger (1954) social comparison process, where self-evaluation requires actively attending to others' performance while exposing one's own standing to scrutiny. In short, social encouragement measures what others do to the user. SENG measures what users do with their devices' social affordances (Strong et al., 2014).

And three, it differs from social capital, which refers to the structural properties and resources embedded in social networks (Nahapiet & Ghoshal, 1998) rather than the enacted behaviors through which users engage with the social features of a technology artifact. Moreover, Nahapiet and Ghoshal (1998) discussed it in an organizational context. SENG is specifically reconceptualized as a behavioral-actualization construct at the individual level. It captures what users do with the social features of their wearable device, not what they perceive, believe, or possess.

Accordingly, the primary purpose of this study is measurement reconceptualization. We evaluate whether social sharing and social competing warrant treatment as distinct constructs in fitness-wearable research. Affordance-actualization theory provides the theoretical explanation for why these behaviors may converge in use, while competing-model analysis provides the empirical basis for evaluating the alternative operationalizations.

This study examines whether social sharing and social competing, although previously conceptualized as distinct behaviors, remain empirically distinguishable in the context of fitness

wearable use and whether their integrated operationalization as Social Engagement provides a theoretically and empirically defensible alternative. (1), it introduces and formally defines SENG as an integrated operationalization, addressing a gap in the conceptualization of social technology use that is likely to recur as wearables, health apps, and gamified fitness platforms become increasingly prevalent. (2), it evaluates a nine-item (combined from social sharing and competing) reflective measure for SENG demonstrating internal consistency (Cronbach's α, composite reliability, and AVE), convergent validity, and discriminant validity against the habitual use construct. And (3), it provides a competing models analysis demonstrating that the unified SENG specification achieves greater global fit and a larger structural effect size (f^2) than the two-construct baseline model, demonstrating the practical and psychometric advantages of the unified operationalization.

THEORETICAL FOUNDATION

Social Affordances in Fitness Wearable Research

Affordance theory was introduced into IS research by Markus and Silver (2008) from ecological psychology (Gibson, 1979). It conceptualizes the relationship between a technology and its users not in terms of features but in terms of possibilities for goal-directed action. An affordance exists relationally. It is neither the device's property nor the user's alone but emerges from their interaction in pursuit of a goal. Volkoff and Strong (2013) elaborated this framework using critical realism, treating affordances as generative mechanisms that activate observable behavioral outcomes. Strong et al. (2014) extended this to address actualization, thereby converting affordance potential into immediate concrete outcomes, and introduced the concept of affordance bundles to capture cases in which multiple affordances are co-activated during a single goal-directed episode.

Affordance actualization does not inherently require organizational use. Its central theoretical mechanism is relational; action possibilities emerge through the relationship among the technological artifact, actor capabilities, and goals. In organizational settings those goals may be work-related. In consumer wearables they are self-directed health, performance, social comparison, relatedness, and social competing. Unlike organizational systems, where actualization may be shaped by mandated use, formal roles, and organizational objectives, fitness-wearable actualization occurs largely through voluntary, self-directed use. This context therefore provides a useful boundary condition for examining whether affordance bundling also occurs when users independently select which technological possibilities to enact.

In the context of fitness wearables, two broad categories of affordances are recognized. The first category is individual affordances, comprising features such as data collection, data analysis, performance feedback, goal management, and reminders. Individual affordances support self-regulatory behavior and the pursuit of personal health goals (Suh & Li, 2022).

The second category is social affordances, comprising features such as social sharing, social comparison, social competing, coaching, and social encouragement. Social affordances support interpersonal interaction and peer-referenced self-evaluation. Wearable platforms, including ones from Apple, Fitbit, and Samsung, all provide dedicated social infrastructure for these activities, including leaderboards, challenge systems, and activity broadcast feeds. Despite this design

emphasis, the theoretical and empirical treatment of social affordances in IS research is still developing relative to individual affordances, with prior studies treating social sharing and social competing as independent predictors without questioning their discriminant validity.

Social Comparison as the Shared Motivational Substrate

We draw on Festinger (1954), whose social comparison theory (SCT) states that individuals are driven to evaluate their own opinions and abilities. Lacking objective standards, this evaluation is accomplished by comparing themselves to others. Festinger distinguished between opinion and ability comparisons, but in both cases, the motivational substrate is identical, which is, the desire to assess the self through reference to relevant social benchmarks. In the fitness wearable context, both social sharing and social competing can be expressions of the same motivational substrate. Sharing one's step count, workout duration, or activity data publicly is, in effect, an invitation to comparison, i.e., it exposes the user's performance to social scrutiny and implicitly invites others to assess their own performance in relation to it. Social competing formalizes this process. It structures the comparison with explicit rankings, time-bounded goals, and mutual visibility of outcomes. Both behaviors may serve a common underlying evaluative motive, which is why users who engage in social sharing are also those who engage in self-directed health, performance, social comparison, and relatedness goals.

Self-Determination Theory and the Integrated Behavioral Disposition

Self-determination theory (SDT) (Ryan & Deci, 2000) identifies three universal psychological needs that motivate human behavior. One, autonomy (the need to experience one's actions as self-endorsed), Two, competence (the need to feel effective in producing outcomes). And three, relatedness (the need to feel connected to and valued by others). In the fitness wearable context, social sharing and social competing fulfill relatedness and competence. They do so as part of an integrated behavioral orientation, not as independent activities. Sharing a workout achieves relatedness by broadcasting effort to peers. Entering a step challenge achieves competence by benchmarking performance. SDT predicts that these needs are not experienced in isolation. Individuals oriented toward social interaction with a wearable device tend to satisfy both needs simultaneously through its social features. This joint activation of relatedness and competence offers a second theoretical explanation for why social sharing and social competing are empirically difficult to distinguish. We propose they are not two distinct behaviors but two expressions of a unified social engagement disposition.

Prior Construct Treatments and the Theoretical Gap

IS and health informatics research have treated social features in wearable technology through three main construct families. First, social influence, in the UTAUT (Venkatesh et al., 2003), captures users' perceptions of whether important others believe they should use technology. This cognitive belief construct is not behavioral and applies to the technology acceptance rather than post-acceptance engagement. Second, social support in the literature (Suh & Li, 2022) is an external input that positively influences health outcomes. Rooted in the emotional support dimension of social support theory, this framing is unidirectional. The user passively receives peers' motivational signals instead of actively participating in social technology use. Third, social sharing and social competing have been treated as separate behavioral constructs in a few

behavioral intention studies (Zhu et al., 2017). There is limited literature on providing a theoretical basis for treating these constructs as integrated, even though wearable platforms typically bundle their motivational and technological features.

The gap is not merely empirical, it is theoretical. Relevant research is limited in conceptualizing a construct to capture the integrated behavioral pattern through which users actualize the social affordances of their fitness wearable. This gap has consequences. First, it produces violations of discriminant validity when social sharing and social competing are modeled as separate predictors, as the competing models analysis in this study shows. Second, it may misrepresent the technological architecture of wearable platforms, where social sharing and competing features are co-located and jointly activated. Third, it may underspecify the psychological mechanism driving sustained social engagement, conflating a behavioral actualization construct with normative and supportive constructs.

A fourth, architectural explanation reinforces the theoretical convergence above. On contemporary wearable platforms, social competing is not independently accessible. It is structurally dependent on social sharing. For example, a user cannot participate in a Fitbit step challenge, an Apple Watch Activity Competing, or a Garmin Connect group challenge without first having a shared profile with disclosed activity data. Sharing is the technical prerequisite for competing. The platform routes competitive interactions through the same data-broadcast infrastructure as social sharing. This functional sequencing, where sharing enables competing, means the two behaviors are not merely co-occurring but co-constitutive. The architectural inseparability of these features at the platform level is what Strong et al. (2014) describe as affordance bundling, where multiple affordances are co-located and jointly activated during a single goal-directed episode.

RECONCEPTUALIZING SOCIAL SHARING AND SOCIAL COMPETING AS SOCIAL ENGAGEMENT (SENG)

The evaluation focused on the foundational steps for the reconceptualization of SENG. First our focus was on specifying the conceptual domain, second, we focused on defining its content boundaries, and third we focused on distinguishing it from adjacent constructs with which it might be confused (MacKenzie et al., 2011). Each are addressed in this section.

Social Engagement is described as the integrated behavioral pattern through which fitness wearable users actualize social affordances by sharing performance data with and competing against others within their social network. Three elements of this definition warrant elaboration.

First, SENG is a behavioral operationalization, not a perceptual or attitudinal one. It captures what users do with the social features of their device, i.e., the frequency and regularity with which they share activity data, post workout results, enter competitive challenges, and track rankings, rather than what they think, believe, or intend. This positions SENG within the actualization layer of Strong et al. (2014)’s affordance-actualization framework, where actualized affordances produce immediate, concrete outcomes (in this case, social engagement episodes), distinguished from just potentials and from downstream outcomes such as habitual use.

Second, SENG is integrated. It does not treat sharing and competing as separate behavioral dimensions that can be independently low or high. Rather, it captures a unified disposition toward

social participation through the wearable. We elaborate this integration theoretically in the convergence of social comparison theory (Festinger, 1954) and self-determination theory (Ryan & Deci, 2000), as elaborated in the previous section, and is empirically supported when the two behaviors are modeled separately. A user who scores high on SENG is one who regularly and actively uses the social infrastructure of their wearable device as a site of interpersonal engagement, both disclosing their own performance and attending to others.

Third, SENG is device-mediated and goal-directed. It is not general sociability or social media use, but specifically the actualization of social affordances embedded in fitness wearable platforms. This domain restriction is intentional. It maintains construct precision and avoids conceptual conflation with broader social-technology-use constructs.

NOMOLOGICAL POSITIONING

SENG is positioned within a broader nomological network by identifying the relationship examined empirically in this study and the broader relationships proposed for future research. It is important to note at this point that this paper does not model or test the antecedents of SENG. The empirical scope is limited to the competing models analysis, which tests SENG's predictive relationship with Habitual Use as a criterion for nomological validity. The broader affordance-actualization model, in which social affordances are theorized as antecedents of SENG, is proposed as a theoretical proposition for subsequent structural modeling and is not estimated here.

A reconceptualized construct achieves theoretical credibility by demonstrating a coherent nomological network, i.e., a set of theoretically based relationships with antecedent, concurrent, and consequent constructs (Cronbach & Meehl, 1955; MacKenzie et al., 2011). We position SENG within a broader affordance-actualization model of fitness wearable continuance and identify its primary antecedents and consequences (antecedents are only theoretically proposed, not tested in this study).

Antecedents such as Social Affordances are the relational potentials for interpersonal action arising from wearable device features such as leaderboards, challenge systems, activity feeds, and social sharing interfaces, and are the theoretical antecedents of SENG. Following the affordance-actualization logic (Volkoff & Strong, 2013), social affordances represent the potential, and SENG represents its actualization. Users who perceive richer social affordances in their devices should exhibit higher SENG, because the breadth and accessibility of social features determine the ease with which interpersonal engagement can be enacted. We suggest social affordances to be specified as a formative higher-order construct comprising first-order dimensions, including data sharing, social encouragement, coaching, competing, and comparison (Suh & Li, 2022).

We focus on consequences such as Habitual Use (HU) or Continuous Use (CU) (CU only proposed here, not tested). Following Limayem et al. (2007)'s conceptualization, habitual use is the degree of automaticity with which users incorporate wearable device use into their daily routines, i.e., use that occurs without deliberate conscious initiation. We theorize that SENG is positively associated with HU and social engagement with the reciprocal accountability structure. When users regularly share and compete through their devices, peers expect continued participation, creating social obligations that sustain device use beyond the point at which initial motivation might otherwise attenuate. This mechanism is consistent with evidence that social accountability is among the

strongest predictors of sustained physical activity behavior (Suh & Li, 2022). Social engagement further habituates use by embedding the device in interpersonal routines, including checking rankings, responding to challenges, and acknowledging peers' activity posts, which recur often enough to become automatic. In the broader model, HU can, in turn, predict continuous use intention (CU) (we do not test this in this study), consistent with Bhattacherjee (2001)'s expectation-confirmation model of IS continuance. Table 1 shows how SENG is differentiated from the three adjacent constructs with which it is most likely to be conflated in the wearable literature.

Table 1. Differentiating SENG with Other Adjacent Constructs

Construct	Definition/Domain	Key difference from SENG
Social Influence (SI) (Venkatesh et al., 2003)	Normative perception that important others believe one should use a technology.	This is a cognitive belief construct. Pre acceptance stage. This is not behavioral, and not wearable use enacted.
Social Encouragement (Suh & Li, 2022)	Receiving motivational signals and emotional support from others through the device.	It is unidirectional as the user is the passive recipient.
Social Capital (Nahapiet & Ghoshal, 1998)	Structural and relational resources embedded in a social network.	Network-level construct. Captures what users possess, not what they do with the device features.
Social Engagement (SENG) (This paper)	Integrated behavioral pattern of sharing performance data and competing with others via the wearable.	Behavioral actualization construct. Post-acceptance, not pre. It is bidirectional and it is device-mediated and goal-directed.

Measurement Specification and Evaluation

This study does not undertake new scale development. Rather, it reconceptualizes and evaluates an integrated measurement specification using items previously developed to assess social sharing and social competing. The initial ten-item pool therefore consisted of five social-sharing and five social-completing items adapted from Zhu et al. (2017). MacKenzie et al. (2011) informed the evaluation/specification process. This study uses PLS-SEM for model analysis. Measurement model assessment followed established PLS-SEM procedures for reflective constructs (Hair et al., 2019; Hair Jr et al., 2021).

As mentioned, the initial pool comprised ten items. Five capturing social competing behaviors (SC1–SC5) and five capturing social sharing behaviors (SS1–SS5). Following measurement model assessment in SmartPLS 4, item SC5 was dropped due to diffuse cross-loadings in the full model, leaving a nine-item final measure. All nine retained items loaded on the SENG measure with outer loadings ≥ 0.846, indicating strong indicator reliability. The final item set is presented in Table 2.

Table 2. SENG Scale Items Adapted from Zhu et al. (2017)

Item Code	Description/wording	Loading Model A	Loading Model B
SS1	I upload my fitness data (e.g., steps, miles, and running trajectory) on social media, leaderboard, or other mobile fitness app.	0.870	0.847
SS2	I comment under others' updates regarding fitness data.	0.857	0.846
SS3	I tend to share my physical activity using social media, leaderboard, or other mobile fitness app.	0.909	0.894
SS4	I volunteer to inform others about the benefit of using fitness trackers/devices on social media, leaderboard, or other mobile fitness app.	0.850	0.828
SS5	I share about the benefits I experience from using my fitness tracker/devices on social media, leaderboard, or other mobile fitness app.	0.901	0.875
SC1	I compete with others for steps using social media	0.861	0.885
SC2	I engage in friendly competing with friends, family, coworkers, or anyone else using my device	0.852	0.832
SC3	I feel left behind if I do not accomplish the team challenge goal	0.865	0.839
SC4	I am motivated by competing with others	0.850	0.808
SC5 (Excluded)	*I feel a great sense of achievement when I complete competitive goals and receive achievements and badges.*	*0.737*	*Excluded*

Note. All items rated on a seven-point Likert scale (1 = Strongly Disagree, 7 = Strongly Agree). SC1–SC4 = Social Competing items; SS1–SS5 = Social Sharing items. SC5 excluded due to diffuse cross-loadings in the full structural model. Zhu et al. (2017) presented these separately as Social Sharing and Social Competing constructs.

SENG as a latent disposition is positively associated with sharing and competing among users. This is consistent with the theoretical account discussed in previous sections, in which SENG is defined as an integrated behavioral orientation rather than a formative composite of distinct activities. Under a formative specification, dropping an item would change the construct's meaning. Under the reflective specification it does not imply that sharing and competing are behaviorally identical activities. Rather, it proposes that, within this sample and technological context, responses to these activities covary as manifestations of a broader social-engagement orientation sufficiently strongly that modeling them as distinct latent variables may not be empirically warranted.

This specification does not imply that sharing and competing cease to be conceptually identifiable behaviors. The question is whether they function as empirically separable latent constructs in this context. A higher-order specification would preserve them as distinct first-order dimensions. That specification presupposes meaningful dimensional distinctiveness. The observed insufficient discriminant-validity calls that assumption into question. Therefore, the parsimonious reflective specification is evaluated. Future research should compare reflective, reflective-reflective higher-order, and composite/formative specifications across populations and platforms.

COMPETING MODELS ANALYSIS

Data and Method

Evidence for SENG comes from an online survey of 1,028 US adults who actively use smart fitness devices. Participants were recruited via a Qualtrics panel identifying the device used and degrees

of usage. Data quality was protected by retaining only complete responses and by enabling Qualtrics' automated safeguards against automated, duplicate, and fraudulent submissions. Eligible participants were required to own and actively use a fitness wearable device, which by design excludes non adopters. This inclusion criterion is appropriate given that SENG captures post adoption behavioral actualization, where the research objective concerns the nuances of sustained usage rather than the initial adoption decision. This design choice does, however, introduce a form of self-selection bias, as the sample likely over-represents highly motivated or technology literate individuals, which could inflate scores related to behavioral actualization. The sample did span a wide age range of US based users, providing diversity across age, though this does not by itself offset the motivational self-selection noted above. Consistent with the study's focus on construct reconceptualization, the analysis does not employ demographic or usage related covariates; although these characteristics were collected, their moderating influence on the SENG-Habitual Use relationship is examined separately in a companion multi group analysis, and the self-selection concern is acknowledged in the limitations.

All questions used a seven-point scale, and analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM) in SmartPLS 4. Because all measures were self-reported in a single cross-sectional survey, common method bias was assessed using the full collinearity approach; all variance inflation factors fell below the threshold, indicating that common method bias does not threaten the findings. This is reinforced by the pattern of results itself: a general method factor would affect inter-construct correlations uniformly, yet discriminant validity held between SENG and habitual use and failed only between social sharing and social competing.

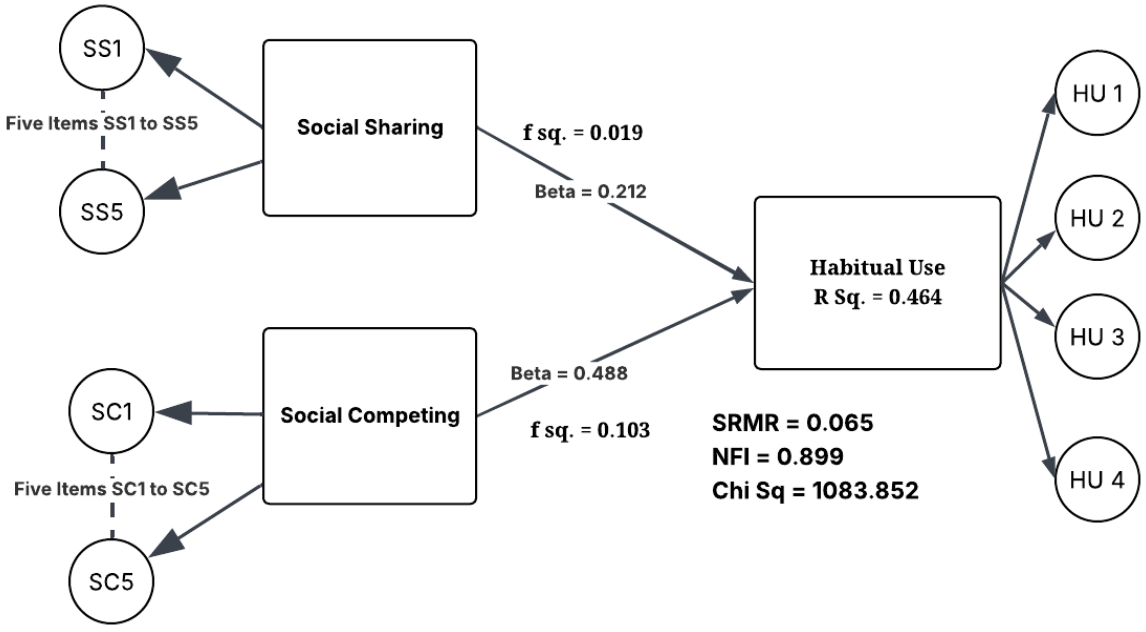

Figure 1. Model A

Next, we empirically justify the operationalization of the SENG construct. We present a competing models analysis by comparing two models in this section. Model A retained social sharing and competing as distinct constructs, whereas Model B combined the two and eliminated one (SC5) item due to diffuse cross-loadings. Both models were estimated in SmartPLS using PLS-SEM with n=1,028 (user data). The outcome variable, Habitual Use, was adopted from Oc and Plangger (2022) and Venkatesh et al. (2012). Both Figures 1 and 2 highlight this operationalization.

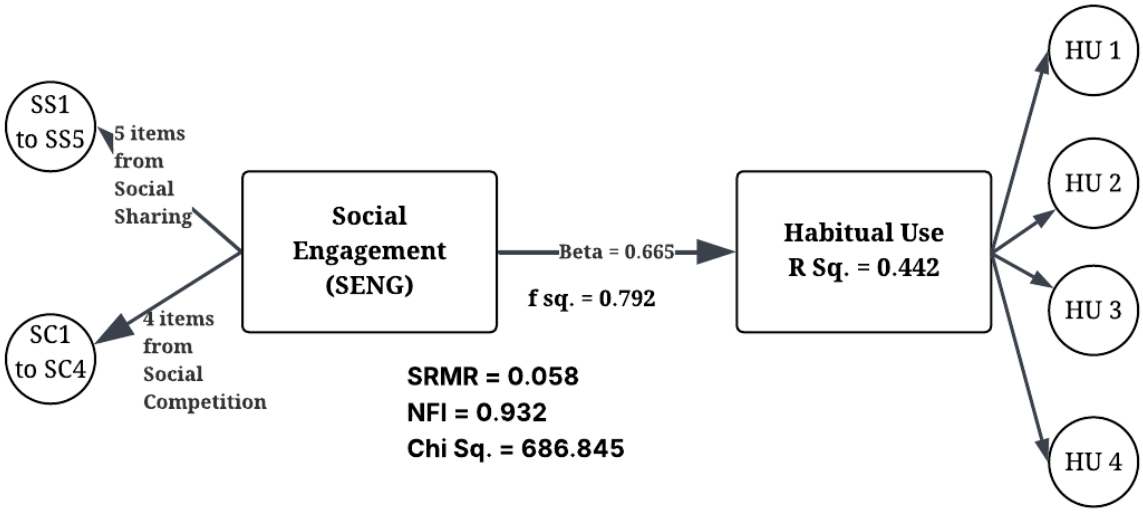

Figure 2. Model B

Based on Figures 1 and 2, we present the consolidated and comparative path coefficient data in Table 3. In Model A, both social competing and social sharing were statistically significant predictors of Habitual Use. However, the effect sizes diverged markedly. Social competing yielded a small-to-medium effect ($f^2 = 0.103$), while social sharing produced only a negligible effect ($f^2 = 0.019$), suggesting that the two constructs do not contribute equally or distinctly to the outcome (HU).

Table 3. Path Coefficients Model A, Versus Model B

Path	Beta value (β)	T-stat	P-value	95% CI
Model A: Two-Factor (Social Competing + Social Sharing → Habitual Use)				
Social Competing→Habitual Use	0.488	9.085	< .001	[0.382, 0.593]
Social Sharing→Habitual Use	0.212	3.831	< .001	[0.103, 0.319]
Model B: Unified SENG Construct (Social Engagement → Habitual Use)				
SENG→Habitual Use	0.665	34.475	< .001	[0.627, 0.703]
SENG 9 items: Composite reliability (rho_c) = 0.959; Cronbach's alpha = 0.952; Average Variance Extracted (AVE) = 0.724				
Discriminant validity: SS-SC (Model A) = 0.965 (HTMT Violated); SENG – HU (Model B) = 0.738 (Satisfied)				

Note. SENG = Social Engagement, all bootstrapping based on 10K subsamples. Confidence intervals are bias-corrected. β = standardized path coefficient; CI = confidence interval.

In Model B, the unified SENG construct demonstrated a stronger path to Habitual Use with a large effect size ($f^2 = 0.792$), well above the threshold of 0.35 for large effects. Model fit comparisons further support Model B. Model B achieved a greater Standardized Root Mean Square Residual (SRMR) of 0.058 compared with 0.065 for Model A. Both values are below the 0.08 threshold recommended by Henseler et al. (2014). The Normed Fit Index (NFI) for Model B (0.932) exceeded that of Model A (0.899) and approached the conventional 0.95 benchmark. The chi-square statistic, which assesses model fit, was also lower for Model B (686.85 vs. 1083.85), consistent with improved global fit. Although Model A produced a marginally higher R-squared (R^2) for Habitual Use (0.464 vs. 0.442), this small gain came at the cost of discriminant validity, parsimony, and conceptual coherence. Notably, Bayesian Information Criterion (BIC) favored Model A (−622.11 vs. −586.63).

Table 4. Model Fit and Selection Criteria Comparison

Criterion	Model A	Model B	Preferred
R^2 (Habitual Use)	0.464	0.442	Model A (marginal)
f^2 (effect size)	0.103 / 0.019	0.792 (large)	Model B
SRMR	0.065	0.058	Model B
NFI	0.899	0.932	Model B
Chi-square	1083.85	686.85	Model B
BIC (Habitual Use)	−622.11	−586.63	Model A
No. of predictors	2	1	Model B (parsimony)
Discriminant validity (HTMT)	Violated	Satisfied	Model B

Note. SRMR = Standardized Root Mean Square Residual; NFI = Normed Fit Index; BIC = Bayesian Information Criterion. Lower SRMR, lower chi-square, and more negative BIC indicate better fit. Higher NFI indicates better fit.

Taken together, the competing-model results provide mixed but generally supportive evidence for the unified specification. Model A retains a modest advantage in explained variance and BIC, whereas Model B demonstrates stronger performance on SRMR, NFI, chi-square, parsimony, effect size, and most critically, discriminant validity. These findings therefore do not establish the unified model as uniformly superior; rather, they indicate that the SENG operationalization represents a theoretically coherent and empirically defensible alternative when the distinction between social sharing and social competing cannot be sustained.

DISCUSSION

This study focusses on whether social sharing and social competing, two theoretically and technologically distinct social affordance features of fitness wearables (Zhu et al., 2017), constitute separate constructs or converge into a unified behavioral pattern. The theoretical argument grounded in Strong et al. (2014)'s affordance-actualization predicted convergence, and the empirical analysis of 1,028 user data suggest that responses are empirically difficult to distinguish. This section discusses theoretical contributions and practical implications.

Theoretical Contributions

This study attempts to contribute to the theory in the following ways. First, this study questions the assumed empirical distinctiveness of social sharing and social competing in fitness-wearable

research and provides evidence that the distinction may not hold in this sample or context. Affordance theory explains this by focusing on how users interact with the device, rather than its features alone (Markus & Silver, 2008). Actual user actions depend on their goals and context, not simply on what the technology offers.

Second, it proposes Social Engagement as an integrated reconceptualization and alternative operationalization of those behaviors and evaluates that specification against the traditional two-construct representation. While Strong et al. (2014) was based on organizational case studies, this study shows that even individual users of consumer technology, such as fitness wearables, naturally combine sharing and competing into a single Social Engagement behavior with strong measurement support. This means, affordance bundling isn't just due to organizational settings, rather, it's a common way users interact with technology when multiple features support the same goal. The findings attempt to broaden the reach of Strong et al. (2014)'s framework.

Third, it uses affordance actualization to offer a theoretical explanation for why technologically distinguishable features may become behaviorally intertwined in voluntary consumer technology use, while recognizing that this integration may be context-and user-dependent. This is an opportunity for IS researchers to use these situations to check if constructs truly reflect distinct user behaviors.

Practical Implications

For fitness wearable designers, the observed convergence suggests that designers may benefit from considering sharing and competing as related components of social engagement rather than assuming that users experience them as entirely distinct. Products such as Apple Watch (activity sharing), Strava (leaderboards), and Garmin (connect) challenges, demonstrate the benefits of merging these social elements. Instead of tracking, sharing, and competing separately, using a single Social Engagement metric better reflects behavioral nuances supporting post-adoption usage. For researchers and practitioners, the SENG construct provides a simpler way to measure social behavior related to sharing and competing. Using the nine-item SENG measure yields more accurate and reliable data, and future research should examine whether it also works well across different ages and device brands.

LIMITATIONS

This study has several limitations. First, it used a single online survey at one point in time. Although the sample size (N = 1,028) was large, collecting data over time would help show whether the link between sharing and competing stays consistent or changes as people use wearables longer. Early users might see sharing and competing as more distinct than experienced users do.

Second, the model focused narrowly on social engagement and habitual use. The SENG construct should be tested more broadly in future studies alongside other factors, such as social influence and accomplishment. And third, all data came from U.S. users. Social norms about sharing and competing differ across cultures, so it's important to repeat this work in other countries to see whether the results remain consistent. Future research should also examine whether SENG relates

to wearable use differently across brands and consider how new features, such as AI coaching, could expand or alter the construct.

Additionally, the competing models analysis does not control for user-level heterogeneity. Usage intensity, device brand, age, and gender may moderate the degree to which sharing and competing are perceived as unified. For instance, competitive users may show stronger behavioral integration of SENG, while passive social users may exhibit more separation. Further, item wording, common-method effects, and sample self-selection may contribute to the observed empirical relationships. Future research should replicate the competing model's designs, including control variables and across user subgroups, to assess boundary conditions of the SENG construct.

Importantly, the observed convergence may also be context-dependent, reflecting the extent to which particular wearable platforms technologically integrate sharing and competing features. Some users may share activity information primarily for accountability, encouragement, or social connection without competitive motivation, whereas others may engage strongly in challenges and rankings while engaging minimally in broader sharing.

CONCLUSION

This study reconceptualizes Social Engagement (SENG) as an integrated operationalization of social sharing and social competing in fitness-wearable use. Grounded in affordance-actualization theory and evaluated through a competing-models analysis, the findings indicate that social sharing and social competing are empirically difficult to distinguish in this sample. Although the two-construct specification retains advantages on R^2 and BIC, the integrated SENG specification demonstrates advantages on several other model criteria and provides a theoretically coherent alternative when discriminant validity between sharing and competing cannot be established. The findings further suggest that affordance bundling may provide a useful theoretical lens for examining voluntary consumer technology use, which future research should determine whether this convergence persists across users, platforms, and contexts.

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