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Social interaction, support preferences, and the use of wearable health trackers

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Introduction: Drawing on uses and gratifications theory, social cognitive theory, and related work, this research assessed how social factors relate to reported weekly use and behavioral intentions toward the use of wearable health trackers (WHT).

Methods: Through two studies we surveyed current users of WHT, including smartwatches, to better understand what factors encouraged engagement. Study One ($N = 333$) consisted of a college student sample. Study Two ($N = 319$) was conducted through an online panel from Prolific.

Results: For Study One, results suggested that connection, social comparison, and one's comfort with seeking support predicted weekly use, while need for support was a negative predictor of device use. In terms of behavioral intentions, connection and one's comfort with seeking support remained positive predictors. For Study Two, only one's comfort with seeking support predicted weekly use, while one's comfort with seeking support and social sharing both predicted behavioral intentions. Additional analysis in Study Two comparing users of dedicated WHT and smartwatches also found differences in terms of behavioral intentions and social sharing.

Discussion: Collectively, the two studies offer insight into what social factors contribute to the use of WHT, including evidence that one's need for support for exercise may serve as a barrier to WHT use.

KEYWORDS

social cognitive theory, social interaction, social support, wearable health tracker, uses and gratifications theory

1. Introduction

Increased availability of wearable health trackers (WHT) has contributed to a rise in ownership (Vogels, 2020). There is also increasing evidence that the use of WHT can improve health and fitness, which in turn can play a role in better physical and mental wellness (Stiglbauer et al., 2019). Many functions and features available through WHT encourage engagement, including the opportunity for social interaction, and motivation both from the device and other users. For most WHT, owners can connect with friends, family, and in some cases, strangers, to share and encourage engagement directly through their tracker or a dedicated application (app). For example, Apple Watch users can share their activity with friends and challenge them to a competition (Persaud, 2023). Samsung devices also have a feature called "Together" that will let a user not only engage in competition with friends but join challenges to compete with anyone around the world (Vyas and Iyer, 2023). Owners of WHT can also share personal statistics from their device through social media to further build a network to motivate and support them in meeting their health goals (Gowin et al., 2019; Kononova et al., 2019; Lewis et al., 2020). Indeed, sharing both through dedicated apps for WHT and online through social media can help to expand one's network and opportunity to interact and gain support beyond one's offline

interaction network (Zhu et al., 2017; Girginov et al., 2020). At the same time, there is a risk that these same social features may contribute to negative social comparison, influencing user's mental health and affecting long-term physical health goals and continued WHT use (Nuss and Li, 2021; Huang et al., 2022; Kim, 2022). In this regard, social factors tied to WHT hold the potential to motivate and improve health and wellness for some, while discouraging use and negatively affecting health and wellbeing for others.

In addition to features of WHT, ownership of a device that integrates tracking features, such as an Apple Watch or Samsung Galaxy, vs. a dedicated tracker, like FitBit or Oura, may also influence outcomes. The former category represents devices that serve several functions and integrate health and fitness tracking features, while devices like the FitBit (watch) or Oura (ring) are meant to primarily be a health fitness tracker, though may also have additional features. Research on smartwatch ownership has identified health tracking as one, but not the primary reason for purchasing the device (Dehghani, 2018), while purchasing a device that emphasizes health tracking as a primary function could signal differences in use and motivations, something that has not been heavily explored in earlier research on WHTs.

Drawing from a uses and gratifications theory (Katz et al., 1974) and social cognitive theory (Bandura, 2002) framework, the current study examines how social factors may influence the reported weekly use of WHT and behavioral intentions toward future use. We contribute to the existing literature base by testing assumptions related to social sharing (e.g., Zhu et al., 2017) while also situating additional social factors that have been less studied within the context of WHT. This includes the number of connections formed through one's device (Girginov et al., 2020), one's need for social support for exercise (Sallis et al., 1987), one's comfort with seeking support from their social network (Wright and Miller, 2010), and social comparison (Attig and Franke, 2020). In Study One, we sampled college students, a demographic category previously identified as more likely to use WHT (Vogels, 2020). Study Two utilized the online panel company, Prolific, expanding on the results from Study One to a broader population of WHT owners. Study Two also assessed if device type influenced engagement, as participants of Study One were primarily smartwatch owners. Together, the two studies reflect on how social factors relate to the reported weekly use and behavioral intentions toward the future use of WHT.

2. Theoretical framework

Uses and gratification theory (UGT) argues that individuals have different needs that can inform the use of media to gratify that need (Katz et al., 1974). More specifically, when someone has a particular need (e.g., interaction, information seeking), it can motivate them to be selective in their media use to fulfill that desire. While initially framed in terms of traditional media, such as TV and newspapers, research has since expanded to apply UGT to a wide range of communication technologies, including social media (Quan-Haase, 2012). More recently, work has also expanded to apply UGT to health and fitness goals, with an emphasis on mobile health (mHealth) apps (Lee and Cho, 2017; Dam et al., 2018) and social networking (Zhang and Jung, 2019; Zhou and Krishnan, 2019). WHT have the potential to gratify various needs in users, promoting continued use. One potential motive for mHealth app use and discussing health online is social interaction and connection (Lee and Cho, 2017; Zhang and Jung, 2019). In this way, WHT may support relatedness needs rooted in one's need to connect with others and social inclusion (e.g., need to belong, Baumeister and Leary, 1995). Similarly, research has also considered how social media sharing may be a way to gain information and receive support for health goals (Zhang and Jung, 2019; Zhou and Krishnan, 2019). Individuals who have a greater need for information may, as a result, be more likely to engage in social sharing behaviors online. Finally, research has also considered how self-presentation or impression management-based motives influence sharing behaviors (Zhang and Jung, 2019; Zhang, 2022). The ability to fulfill the need for self-expression is another factor that may influence WHT use.

In support of our interest in motivating factors, we also integrate social cognitive theory (SCT) for understanding behavioral decisions related to WHT use. As Zhou and Krishnan (2019) note, there is a benefit to drawing from multiple theoretical perspectives to best understand the range of factors that influence exercise and health. SCT argues that a combination of personal and environmental factors informs behavioral intentions (Bandura, 2002). More specifically, an individual's evaluation of these factors can contribute to them establishing goals or standard expectations, which subsequently drive behavioral choices. SCT has been applied successfully in past work within the context of fitness and health (e.g., Marmo, 2013; Liu et al., 2022) and more recently, WHT and broader mHealth initiatives (Lee and Cho, 2017; Lin and Chang, 2018; Gowin et al., 2019). In each case, both personal and environmental factors have been identified as driving engagement.

UGT and SCT are complementary in understanding engagement with WHT. Through UGT we gain an understanding of motivations and gratifications that drive use, while SCT's emphasis on behavioral change processes allows us to better understand future intentions. We expand on UGT and SCT to identify how social factors may relate to the use of WHT. In doing so, we reflect on how motives help to fulfill a variety of needs, including social connection, self-expression, social support, and information sharing. Based on this theoretical framework, we identified five social factors to explore further: *connections made through the device*, *one's need for support*, *one's comfort with seeking support from friends and family*, *social sharing*, and *social comparison*.

2.1. Connections

The first factor we considered was connections formed through WHT. Most WHT facilitate the opportunity for users to add someone as a "friend" or "follower" through apps associated with the device. This feature enables daily sharing of statistics and progress, and the chance to interact directly with other users. Despite being a common feature of WHT, Girginov et al.'s (2020) systematic review of social interaction stimulated by WHT found most research to date emphasized social media sharing about health information gained from the device, rather than direct

connections formed on the device. Research typically considers a specific function of connections (e.g., to compete) rather than the number or type of connections, presuming that if someone is using that feature, they must be connected with other users. That said, Kononova et al. (2019) did find that for older adults, a sense of "togetherness" with others by connecting through the WHT motivated further use. This aligns with UGT in that social features of WHT may fulfill relatedness needs for some owners. For example, Lewis et al. (2020) found that 35.5% of their participants socialized through their WHT, of which roughly half found the feature helpful. Huang et al. (2022) also noted that users who followed more friends on WeRun engaged in more fitness behaviors, suggesting that connections made within WHT may influence use and engagement. Finally, there is also potential value in having followers who, even without regular interaction, can help to hold a device user accountable by virtue of the connection existing (Tikkanen and Barnhouse, 2017; Russell et al., 2023). Knowing this, we posed the following research question:

RQ1: *How do the number of connections maintained through wearable health trackers relate to (a) reported weekly use and (b) behavioral intention toward use?*

2.2. Need for support

One's need for support refers to if someone believes support would help them to perform a desired action. While there is evidence that social support can drive engagement with technology to support health (e.g., Kim et al., 2017), not everyone may desire or need support to facilitate their health goals. For instance, research on WHT and mHealth apps have discussed social support, but it is often related to perceived availability of support, rather than the desire for support (need function). Starting from an assumption that available support influences engagement fails to account for variability that may arise for individuals in how they approach health and interaction with their social network. Some individuals may not need support for exercise, while others may require some degree of emotional, information, or esteem support to help them. In their assessment of support and fitness for example, Zhou and Krishnan (2019) explored the relationship between informational and emotional social support and exercise, suggesting based on their findings that one's need for companionship may better reflect how support can influence health and fitness. In combination with the literature suggesting WHT users do not always connect with others through their device, it may also be that social support is not a primary function that users expect when it comes to WHT. For example, Dam et al. (2018) found no relationship between need for support and the adoption of mHealth apps. Thus, owners of WHT may not see social support as a need that can be gratified from device use.

At the same time, support may come though other features of WHT, not just one's social network. For those who need support and encouragement to exercise, Gowin et al. (2019) discussed the potential for the device itself to meet support needs, particularly for those who were adopting a new behavior or who felt like their network could not help them. With some WHT offering celebratory messaging when goals are achieved, it can be a way to support users' continued use (Kreitzberg et al., 2016; Gowin et al., 2019). While not all WHT owners enable motivational cues from their device, research suggests that these features can be useful (Lewis et al., 2020). A key component of the need for support is recognizing that for some, they feel perfectly capable of engaging in a behavior without someone (or something) cheering them on. Exploring how one's need for support relates to the use of WHT may also shed additional light on factors related to one's comfort with seeking social support and social sharing online, which are discussed more in depth below. As such we asked:

RQ2: *How does the need for social support relate to (a) reported weekly use and (b) behavioral intention toward use of wearable health trackers?*

2.3. Comfort with seeking support

Closely related to one's need for support is their feeling they could seek support from family and friends, referred to in the present study as one's comfort with seeking support. One's comfort seeking support from their network is often dependent on their past experiences with social support received, wherein support gaps can influence how likely someone is to seek support (Wright and Miller, 2010). While there is ample evidence that communication technology, such as online communities and social media, can create the potential to form new connections entirely online for support (e.g., Rains and Wright, 2016; Kim et al., 2017), WHT tend to prioritize connections that are already known, which for many consists of their offline network. Indeed, while Fitbit previously allowed users to form open groups and share with strangers for tracking, this feature was recently removed, limiting sharing to friends and family (Cantisano, 2023). Further, as WHT are tangible objects that are visible to one's offline interaction network, there exists an in-person support level to consider as well, particularly for someone who uses a dedicated WHT instead of a smart watch. The device could signal an emphasis on health and fitness, inviting opinions from one's friends and family that the user may not be comfortable with. Of note, Gowin et al. (2019) identified the theme "social outcome expectations" in their study, which spoke to the general expectation participants had that their network would be supportive of their use of a WHT. The study noted that there were some instances where participant's network did not approve of use, in part because friends and family did not understand why the participant would want to use a WHT, in some cases calling the use of WHT "stupid" (Gowin et al., 2019, p. 46). Reflecting on a device user's comfort seeking support from their network may provide insight into WHTs and future intentions toward use.

Past research using SCT also argues that the provision of social support can increase self-efficacy, which in turn encourages engaging in the desired behavior (Ayotte et al., 2010). In this case, feeling like friends and family will encourage WHT use may help individuals feel capable of meeting health goals, and as a result, help them commit to regular WHT use. As such we asked:

RQ3: *How does one's comfort with seeking support from friends and family relate to (a) reported weekly use and (b) behavioral intention toward use of wearable health trackers?*

2.4. Social sharing

As users receive data about their progress, WHTs also may encourage sharing information socially online, typically through social media or online communities or discussion boards. Notably, Zhu et al. (2017) found that social sharing was related to behavioral intentions for exercise. Zhang (2022) also noted that social sharing through social media was related to the use of fitness apps (e.g., Fitbit, Samsung Health, MyFitnessPal). Similarly, Chang et al. (2016) reported through interviews and focus groups with middle-aged adults that sharing on social network sites about the use of a WHT encouraged greater levels of fitness and device use. In line with UGT, Kreitzberg et al. (2016) also discussed how users would share their WHT stats online to gain support toward goals. Research from Dam et al. (2018) also found that social utility functions (e.g., sharing one's fitness content with their network) motivated users to engage with mHealth apps. Related research from Kim et al. (2017) also highlights the benefits of social sharing; they found that sharing had a significant positive relationship with weight loss, underscoring relatedness needs that can be associated with device use (UGT). Given the strong body of evidence regarding social sharing, we hypothesize:

H1: *Users who engage in social sharing will have greater (a) reported weekly use and (b) behavioral intention toward the use of wearable health trackers.*

2.5. Social comparison

The final socially driven factor we consider is social comparison. When WHT users engage in social comparison and discover that their fitness levels do not match their expectations in relation to peers, it may decrease self-esteem and subsequent device use (Attig and Franke, 2020; Nuss and Li, 2021). Similarly, Li et al. (2019) found that when users compared themselves to someone outperforming them, it could lead to frustration and decrease use. Further, past work has identified concerns related to WHT use in terms of mental health and body image (Scheid and Lupien, 2021; Zimbars, 2021). While Russell et al. (2023) did find that participants who used the running app Strava considered social comparison as a motivator to use the app more, participants also expressed concern about the negative impacts from comparison, including greater feelings of anxiety and sadness. At the same time, in their study of observing exercise behaviors on social media and attitude toward exercise, Burke and Rains (2019) found that upward social comparison increased one's positive attitude toward exercise. Kim (2022) also reported that when individuals compared themselves to users who were high performers, engagement with the fitness app increased. Given the inconsistent relationship identified between social comparison and mHealth research to date, we asked:

RQ4: *How does social comparison relate to (a) reported weekly use and (b) behavioral intention toward use of wearable health trackers?*

Finally, we were interested in exploring the broader connection between factors within the context of WHT to better understand what social factors were the best indicator of device use and behavioral intentions, asking:

RQ5: *What social factors (i.e., making connections, one's need for support, one's comfort with seeking support, social sharing, and social comparison) most strongly predict (a) reported weekly use and (b) behavioral intention toward use of wearable health trackers?*

3. Study One

3.1. Methods and measures

The first study was administered in the fall of 2022 at a large western university. Students were recruited using a communication research participation pool wherein students enrolled in introductory communication courses could participate in research for course credit. To qualify for participation, students were required to be at least 18 years old and currently own and use a wearable device that enabled health tracking, which included either a dedicated device (e.g., Fitbit) or smartwatch (e.g., Apple Watch).

The survey was completed by 333 students who ranged in age from 18 to 48 (M = 21.39, SD = 4.83, median = 20). Just over half identified as male (51.1%). Participant racial identity varied; 38.7% identified as White/Caucasian, followed by 27.6% Hispanic/Latin(x), 27.6% Asian/Pacific Islander, 15.9% Black or African American, 1.8% other, and 0.9% Native American. Participants were also asked to share what kind of wearable health device they own; most had an Apple Watch (80.5%, n = 268), followed by Fitbit (12.3%), Nike (9%), Samsung Galaxy (5.4%), and Garmin (3%). Other selected choices represented <1% each within the sample, including: LetsFit, Coros, Whoop, Withings, Fossil Watch, and Amazon Halo.

Following IRB approval, the study was made available through the university research pool system. Students were directed to use

TABLE 1 Mean score and reliability analysis for study variables.

	Study One		Study Two	
	Mean (SD)	α	Mean (SD)	α
Use and intention				
Weekly use	3.85 (2.26)	–	5.18 (2.10)	–
Behavioral intentions	3.77 (0.87)	0.81	3.99 (0.65)	0.70
Factors				
Support need	2.72 (1.03)	0.90	2.63 (1.27)	0.92
Social sharing	1.66 (0.92)	0.91	1.69 (0.96)	0.91
Social comparison	1.79 (1.08)	–	1.72 (1.06)	–
Comfort seeking support	2.22 (1.04)	–	3.88 (0.98)	–
Connection	1.53 (0.83)	–	1.51 (0.85)	–

Study One N = 333, Study Two N = 319. No reliability (α) is reported for variables that consisted of 1 or 2 items. For connection, the majority of participants in each study reported connecting with no one (Study One = 63.4%, Study Two = 66.8%) followed by 1–2 people (Study one = 24%, Study two = 20.1%).

TABLE 2 Correlation matrix study one.

Variables	1.	2.	3.	4.	5.	6.
1. Weekly use	–					
2. Behavioral intention	0.19***	–				
3. Connection	0.14**	0.16**	–			
4. Support need	−0.14**	0.07	0.02	–		
5. Comfort seeking support	0.11*	0.24***	0.05	0.02	–	
6. Social comparison	0.13**	0.06	0.19***	0.14**	0.00	–
7. Social sharing	0.05	0.08	0.31***	0.06	0.05	0.48***

$N = 333$.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

the link provided to complete the Qualtrics survey. The survey began with an informed consent statement, followed by questions that confirmed study eligibility. Participants who were interested in the study but did not qualify were at that time thanked for their interest and funneled out of the study. Those who qualified were asked a series of questions regarding their use of their device, and orientations related to health and fitness. Below, individual measures are shared. Table 1 shares the mean scores and reliability of measures for both studies. All scales were found to have achieved acceptable reliability for inclusion (<0.80).

3.1.1. Uses and intentions

To assess how often participants used their device for health reasons, participants were asked to report how many days in a typical week they engaged in the health tracking features (*weekly use*). Participants were also asked to report on their *intentions* toward the use of WHTs, which was a measure adapted from Dam et al.'s (2018) behavioral intentions scale and consisted of three items, including their interest in getting another WHT in the future, and was rated on a scale of 1 (strongly disagree) to 5 (strongly agree).

3.1.2. Social factors

The *need for exercise support* (Sallis et al., 1987, adapted from Dam et al., 2018) consisted of five items that were rated on a scale of 1 (strongly disagree) to 5 (strongly agree). The original scale consisted of 11 items and measured support received (e.g., "offered to exercise with me"). In the present study this was adapted to reflect the need for support, (e.g., "I need someone to exercise with me"). Six items were excluded for redundancy and parsimony (e.g., "Asked me for ideas on how they can exercise more"). *Social comparison* consisted of a single item question, which asked participants, on a scale of 1 (never) to 5 (always) how often they logged into their wearable health tracker and were upset when reviewing their stats compared to other users. *Individual's comfort seeking support* was adapted from Wright and Miller's (2010) support preferences scale which includes four subscales: objectivity, utility, risk, and comfort. Only the two items from the comfort seeking support subscale were used. Items were rated on a scale of 1 (strongly disagree) to 5 (strongly agree) and were averaged together to represent a composite score.

To measure if participants made connections, they were asked how many people they connected with through their device. Options included: *I don't connect with anyone, 1–2 people, 3–5 people, 6–10 people,* and *11+ people*. Finally social sharing was measured using Zhu et al.'s (2017) scale, which consisted of five items, ranging from 1 (never) to 5 (always), including the item "I upload my wearable tracker data (e.g., steps, miles, and running trajectory) on social media, leaderboards, or other mobile apps."

3.2. Study One results

To answer the hypothesis and research questions posed regarding WHT and social factors, an initial correlation test was conducted (Table 2). A positive relationship was identified between weekly use of one's WHT and number of connections (RQ1a), comfort seeking support (RQ3a), and social comparison (RQ4a), while a negative relationship was found between WHT weekly use and need for support (RQ2a). In terms of intentions toward WHT use, number of connections was also a positive relationship (RQ1b), as was comfort seeking support (RQ3b). Need for support (RQ2b) and social comparison (RQ4b) were unrelated to intentions toward use. Finally, no support was found for H1, with social sharing unrelated to weekly WHT use or behavioral intentions.

To assess which factors uniquely contributed to weekly reported WHT use (RQ5a), a hierarchical regression analysis was conducted, controlling for participant demographics: age, race (white), and gender (male). Only factors that were correlated with weekly WHT use were included for analysis. The overall final model was significant, F (7,324) = 5.81, $p < 0.001$ (Table 3). All four variables contributed to the final model; comfort seeking support, social comparison, and connection were significant positive predictors and need for support was a significant negative predictor. As Table 3 shows, need for support was the strongest predictor. The same test was run to assess behavioral intentions for WHT use (RQ5b). As only two factors were correlated with intentions, only comfort seeking support and connection were included for analysis. The final model was significant, F (5,326) = 7.06, $p < 0.001$. As Table 3 shows, both factors were significant positive predictors with similar levels of strength.

TABLE 3 Multiple regression models predicting weekly use and behavioral intentions study one.

	Weekly use	Behavioral intentions
	B (SE)	B (SE)
Demographics		
Sex (male)	−0.17 (0.24)**	−0.10 (0.09)
Age	0.06 (0.03)	0.06 (0.01)
Race (White)	0.11 (0.25)*	−0.05 (0.09)
R^2 change	0.04**	0.02
Factors		
Support need	−0.19 (0.10)***	
Social comparison	0.14 (0.11)**	
Comfort seeking support	0.11 (0.12)*	0.24 (0.04)***
Connection	0.10 (0.15)*	0.14 (0.06)**
R^2 change	0.07***	0.08***
Final R^2	0.11***	0.10***

Standardized beta and standard error reported. $N = 333$.
*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

3.3. Study One discussion

Study One results offer support for the argument that the number of connections users make through a WHT can encourage not only use, but future behavioral intentions, similar to findings from Huang et al. (2022). While in the past social sharing has been identified as encouraging the use of mHealth apps (e.g., Zhu et al., 2017; Zhang, 2022), no such relationship was found in Study One. Another interesting finding was the negative relationship between participants' need for support and their use of their WHT, wherein participants with higher support needs reported less use of their WHT. This may speak to a tension in how WHT are perceived; if users do not feel like the tracker can hold them accountable in the same way a person could, they may seek out alternative means of support to gratify their needs (UGT). Social comparison also positively predicted weekly WHT use, in line with research from Kim (2022) and Russell et al. (2023). In this case, when participants experienced greater frustration that other users were outperforming them, they were more likely to increase the use of their WHT.

While Study One provided initial insight into what social factors relate to the use of WHTs, potential limitations may exist in terms of the generalizability of the sample to a broader population of device owners. More specifically, the college student sample consisted of a high number of smartwatch owners (e.g., Apple Watch, Samsung Galaxy) rather than ownership of a dedicated WHT. While college students have been identified as likely owners of WHT devices (Vogels, 2020), this also limits the results to just this category of users. As such, we sought to build on Study One by sharing the survey a second time with a non-college student sample through an online panel company, Prolific. In addition to reflecting on the previously stated RQs and hypothesis, we asked:

RQ6: *Do dedicated wearable health tracker owners differ from smartwatch owners in terms of their (a) reported weekly use and (b) behavioral intentions toward their device?*

RQ7: *Do dedicated wearable health tracker owners differ from smartwatch owners in terms of what factors relate to their device use?*

4. Study Two

4.1. Methods and measures

The second study was also administered in the fall of 2022, however it used the online panel company, Prolific, to assess wearable health device use to expand the study beyond college students and ran ∼1 month after the student data was collected. As the student sample were primary smartwatch owners, the intent was also to better represent the wider range of WHT available while also attending to a greater range of users (e.g., age, education level). Past research exploring sampling through Prolific in comparison to other platforms has found it to be a reliable source of data (Douglas et al., 2023). To qualify for participation, users were required to have a 95% or better approval rating on prior studies completed, be at least 18 years old, and currently own and use a device that enabled wearable health tracking, which included either a dedicated device (e.g., Fitbit) or smartwatch (e.g., Apple Watch). Participants were paid $1.25 upon successful completion of the survey.

The first question of the survey asked participants to identify what devices they owned, if any. If they selected 'I do not currently own a wearable device' they were thanked for their time and encouraged to return the claimed slot. This resulted in 26 returned cases. Outside of these 26, the survey was completed 340 times. Cases that were three standard deviations below the mean ($n = 2$) were rejected. Additional analysis of the data, with an emphasis on open-ended text responses and an instructional manipulation check that had participants select a specific response and streamlining resulted in the removal of 19 additional cases.

This left us with 319 participants, who ranged in age from 18 to 76 ($M = 36.71$, $SD = 12.07$, median = 34). Just over half identified as female (52.4%). Participants primarily identified as White/Caucasian (78.1%), followed by Black or African American (10%), Asian/Pacific Islander (9.1%), Hispanic/Latin(x) (6.3%), Native American (2.2%), and Other (.3%). Participants were asked to share what kind of wearable health devices they own, most participants had an Apple Watch (50.2%), followed by Fitbit (39.2%), Samsung Galaxy (14.4%), Garmin (5.3%), and Nike (3.8%). Other selected choices represented <1% each within the sample, including: LetsFit, Coros, Whoop, Withings, Fossil Watch, Amazon Halo, and AmazeFit. To assess differences in smartwatch and dedicated device ownership, categorical responses were re-coded into a binary variable (1 = dedicated device ownership, 0 = smartwatch owners). Within the sample, 53.9% of participants ($n = 172$) indicated they owned one or more dedicated health trackers and did not own or use a smartwatch.

Following IRB approval, the study was made available through Prolific. Participants were directed to use the link provided to complete the Qualtrics survey. The survey began with an informed consent statement, followed by questions that confirmed study eligibility. Participants interested in the study but did not qualify

TABLE 4 Correlation matrix study two.

Variables	1.	2.	3.	4.	5.	6.
1. Weekly use	–					
2. Behavioral intention	0.18***	–				
3. Connection	0.06	0.18***	–			
4. Support need	−0.13*	0.12*	0.13*	–		
5. Comfort seeking support	0.11*	0.19***	0.05	−0.01	–	
6. Social comparison	−0.11*	0.23***	0.23***	0.36***	−0.03	–
7. Social sharing	−0.05	0.33***	0.35***	0.24***	0.05	0.41***

$N = 319$.
*$p < 0.05$ and ***$p < 0.001$.

were at this time thanked for their interest and funneled out of the study. Those who qualified were provided with the same survey administered in Study One. For the full study mean scores and reliability analysis, please refer to Table 1 for comparison between Study One and Study Two.

4.2. Results

The first goal of Study Two was to build on results from Study One related to each of the factors and weekly use of WHT and behavioral intentions toward WHT. To begin, an initial correlation test was conducted (Table 4). Weekly WHT use was negatively related to need for support (RQ2a) and social comparison (RQ4a), and positively related to comfort seeking support (RQ3a). Weekly WHT use was unrelated to number of connections (RQ1a) or social sharing (H1a). In terms of WHT behavioral intentions, connections (RQ1b), support need (RQ2b), comfort seeking support (RQ3b), social comparison (RQ4b) and social sharing (H1b) were each positively related.

To assess how the factors uniquely contributed to weekly use of WHT (RQ5a), a hierarchical regression analysis was conducted, controlling for specific demographics of participants: age, race (white), and gender (male). Building on this, the present study also included device type as a control (dedicated health tracker). Only factors that were correlated were included for analysis (need for exercise support, social comparison, and comfort seeking support). The overall final model was significant, $F\ (7,311) = 2.82$, $p < 0.01$. As Table 5 shows, comfort seeking support was the only significant predictor of reported WHT use. A second regression was run to assess behavioral intention (RQ5b), with all factors included for analysis based on the initial correlations. The final model was significant, $F\ (9,309) = 6.95$, $p < 0.001$. Social sharing and comfort seeking support were both significant positive predictors that contributed to the final model, no other variables were identified as significant (Table 5).

The second goal of implementing Study Two was to explore potential differences that may arise in terms of device type used (dedicated health trackers vs. smartwatch). Independent sample *t*-tests were conducted (Table 6) to explore use (RQ6a) and social factors assessed (RQ6b). As the results show, dedicated health tracker owners and smartwatch owners did not differ significantly in terms of reported use, however dedicated health tracker owners were slightly more likely to express greater behavioral intentions. Dedicated WHT owners also were more likely to engage in social sharing about their WHT statistics (RQ7).

TABLE 5 Multiple regression models predicting weekly use and behavioral intentions study two.

	Weekly use	Behavioral intentions
	B (SE)	B (SE)
Demographics		
Sex (Male)	−0.13 (0.24)*	−0.06 (0.07)
Age	0.03 (0.01)	0.08 (0.00)
Race (White)	0.08 (0.29)	−0.07 (0.08)
Device (dedicated tracker)	0.03 (0.24)	0.08 (0.07)
R^2 *Change*	0.03*	0.03*
Factors		
Support need	−0.11 (0.10)	0.02 (0.03)
Social comparison	−0.05 (0.12)	0.11 (0.04)
Comfort seeking support	0.12 (0.12)*	0.17 (0.03)***
Connection		0.08 (0.04)
Social sharing		0.24 (0.04)***
R^2 Change	0.03*	0.14***
Final R^2	0.06**	0.17***

Standardized beta and standard error reported.
$N = 319$. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

5. Discussion

While the number of WHT owners has significantly increased in recent years, there is also evidence emerging that many individuals stop using their device within a year of ownership (Attig and Franke, 2020). As a result, understanding what drives continued use is important. Drawing on research and assumptions from uses and gratifications theory (UGT, Katz et al., 1974) and social cognitive theory (SCT, Bandura, 2002), the present study

TABLE 6 T-test results for dedicated health tracker-smartwatch owners study two.

Variables	Health tracker		Smart watch		
	M	SD	M	SD	*t*-value
Weekly use	5.21	2.05	5.15	2.16	0.25
Behavioral intention	4.15	0.57	3.99	0.66	0.30*
Connection	1.48	0.88	1.55	0.81	0.78
Support need	2.60	1.29	2.67	1.24	0.49
Comfort support seeking	2.14	0.98	2.11	0.98	0.31
Social comparison	1.79	1.12	1.65	0.99	1.22
Social sharing	1.84	1.04	1.50	0.83	3.23***

$N = 319$.
*$p < 0.05$ and ***$p < 0.001$.

offers insight into the combination of social factors that relate to both one's reported weekly WHT use and future behavioral intentions toward their device. Further, we provide a comparison between individuals who use dedicated WHTs and those who access health tracking features through a smartwatch to better understand similarities and differences that may arise in ownership motives and use of features. Below, we reflect on these study results and offer practical and theoretical implications for WHT use.

Our results provide evidence that dependent on individual needs, WHTs may be used in different ways to gratify those needs (UGT). More specifically, we discuss below the role of social connection needs in relation to available features. Our integration of SCT also allows for us to expand on WHT use, considering how both personal and environmental factors influence use and behavioral intentions toward WHT. Future research that explores WHT can benefit from integrating social factors outlined in UGT and SCT, which we further highlight below.

Across both studies, one's comfort with seeking support was the only factor that predicted both reported weekly WHT use and behavioral intentions. One's comfort with seeking support may point in part to two separate features of WHT. First is the visibility of a device, particularly for those who opt to use a dedicated health tracker instead of a smartwatch. Gowin et al. (2019) shared an example where a participant discussed being given a hard time for wearing a wearable device; device owners' comfort in letting others see that they use a device may stem from how they perceive their network would respond to their device use. In line with SCT, environmental factors, such as how one's network responds to them wearing a device may drive intentions toward continued use. For example, a WHT may be seen as a more public channel due to the visual component of daily use. The second component of comfort relates to connections made through WHT. The broader internet allows individuals to connect and share with strangers, however WHT devices often limit connections to one's own network (e.g., Fitbit, Cantisano, 2023). With an emphasis on one's primarily strong tie network as points of connection, comfort with turning to family and friends for support may speak to how the use of WHT gratifies social connection needs (UGT).

Another important finding in the present study was that one's need for support for exercise appeared to operate as a potential barrier to WHT use. A negative relationship emerged between one's need for support and WHT use in both studies, with need for support operating as a significant negative predictor of use in Study One, and trending in that direction in Study Two. There are a few reasons why this may be the case. The present results may point to perceptions regarding uses and gratifications of WHT devices. First, those with a greater need for accountability may not feel that a WHT device is sufficient to support their health goals. Those who felt they needed support to ensure they exercise may think that wearable devices are not capable of creating accountability or support, preventing further use. Similarly, exercise that emphasizes device use may be seen as isolating. If users do not have a friend with the same WHT, it may discourage or prevent interaction and as a result, lead to discontinued use (SCT, environmental factors). This is one space where manufacturers and marketing teams can emphasize features of devices and their ability to potentially fulfill support needs both by connecting with other users and from the device itself. For example, Lewis et al. (2020) found that while few users enabled motivational cues on their device, those that relied on these features felt they helped them to exercise more. This also tracks with the tendency to avoid connection with other people through their device. Indeed, in both studies, roughly two-thirds of the participants indicated they did not connect with anyone through their device (Table 1). If users of WHT do not see the devices as affording communication or social interaction, it would make sense that they would not engage in use if they had strong relatedness or support needs (UGT). There may also be privacy concerns or feelings of self-consciousness that create a tension for those who need support; users want that connection but may be afraid to share, particularly when it comes to exercise and health data (e.g., Peng et al., 2016). In line with SCT, social norms about health and privacy may prevent some individuals from enabling social features on their WHT. Importantly, there is evidence that WHT can support interaction and connection; Esakia et al. (2020) found that users who were connected with others sustained higher levels of exercise each week and were twice as likely to meet their goals. This points again to an opportunity for marketing and research into these features of WHT. Future research that explored specifically how the presence, or absence of, network ties through a WHT related to continued device use may help to shed light not only on the negative relationship found for need for support, but the positive relationship with connection.

Social comparison and social sharing are also important to consider, as these two factors differed in the two studies. Social comparison was only a significant predictor of reported WHT use for the college student sample (Study One). Similar to past work (e.g., Burke and Rains, 2019; Kim, 2022), college students who engaged in social comparison also reported greater use of their WHT. For example, Burke and Rains (2019) suggest that individuals may perceive exercise as more beneficial when they engage in upward comparison online. This could create a path toward increased exercise and WHT use. The need to consider

potentially negative outcomes from social comparison however are important. Social comparison can have negative effects on body image and mental health (Scheid and Lupien, 2021; Zimbars, 2021; Russell et al., 2023). While research generally views the desire to engage in more exercise as a good thing, Russell et al. (2023) note that social comparison may encourage exercise to the detriment of individuals. For instance, one participant shared that an injured friend had to delete the Strava app because it made her want to run but she knew she shouldn't risk hurting herself more (Russell et al., 2023). Similarly, Attig and Franke's (2020) analysis of individuals who had quit using their device found that one common reason reported was concerns related to obsessive tracking (31% of participants). That same study noted that negative feedback (24%) and oversaturation of social comparison (23%) also contributed to stopping WHT usage. This finding also speaks to how factors outside the self can influence behavioral intentions (SCT). Future research that considers the appropriate boundary between comparison and motivation can help to better understand opportunities to encourage responsible use of WHT.

In contrast to social comparison, social sharing was unrelated to use or intentions in Study One. Past research has emphasized social sharing and its relationship to exercise intentions and mHealth app use (Chang et al., 2016; Zhu et al., 2017; Dam et al., 2018; Zhang, 2022), however social sharing was only related to intentions in Study Two and was not related to reported use in either study. We offer two potential reasons for these findings. First, many of the past studies included older participants; the average age for Zhang (2022) was 45 years old, and Chang et al.'s (2016) study was focused on older adults. The mean age of participants in Study One was 21 years old, compared to 36 years old in Study Two. In this regard, shifts in expectations for social media use, among other reasons, may have influenced findings. The second reason relates back to previously discussed results, including the lack of connections formed by many participants and the negative relationship with exercise support need. If individuals have privacy concerns with sharing, or feel self-conscious about their health data, they may be less likely to share about their WHT usage online. This doesn't mean individuals do not use their WHT, but instead may be more motivated by non-social features (UGT), which is consistent with our findings.

Finally, Study Two provided the opportunity to directly compare if owning a dedicated WHT vs. a smartwatch influenced use. Dehghani's (2018) analysis of motivating factors for owning a smartwatch highlighted health technology as one component, but it was not always the primary reason users got a smartwatch or selected which watch they would buy. Rather, things like how fashionable a watch was and compatibility with other technology owned (e.g., Apple Watch with iPhone) spurred initial use, while health became a benefit gained after the fact. As the results of the present study show, while smartwatch owners reflected slightly lower behavioral intentions and social sharing, they were otherwise like dedicated device owners in terms of reported use and other social factors explored. In this regard, future research may consider how smartwatches could be a lower entry point to encourage engaging in health monitoring for those who may not feel ready to invest in a dedicated WHT.

5.1. Limitations and future directions

One limitation of the present study is that we did not ask participants to reflect on how satisfied they were with their current health, which likely informs the relationship seen between motivating factors and WHT use. We also did not measure how often participants used social media outside of social sharing, which may help to further unpack the divergent findings from Study One to Study Two. Another limitation of the present study is the cross-sectional study design, which limits the predictive value of the findings. Absent an initial baseline of individual differences, it can be hard to say to what extent some factors are outcomes of engagement or drive use, however it is likely a both/and. Given the results of the present research, we encourage future work to continue to explore what drives the use of not only dedicated WHT, but the health benefits related to the use of a smartwatch that is enabled with health tracking features. This could also help to better parse out the relationship between personal, environmental, and behavioral factors (SCT) that inform WHT use.

We also call for additional research that explores how demographic features relate to the use of WHT, and possible inequalities related to engagement. The present study was not focused on demographic features, however results of the regression analyses conducted suggest that demographics may relate to use. For example, across both studies, we found that women were more likely to use WHTs compared to men. Past work from Kerner et al. (2019) reported that males reported a greater decrease in body dissatisfaction after 5 weeks of utilizing a designated WHT, which may speak to one way in which social comparison can both encourage and discourage WHT use for different people. Needs and perception of gratification for some individuals may differ from others, which can motivate WHT use (UGT).

Related to this is the benefit of exploring more in-depth benefits and drawbacks associated with WHTs. While research has often foregrounded the beneficial physical health outcomes from WHT engagement (e.g., Kamble et al., 2021; Scheid and Lupien, 2021), the implications for mental health have been less studied. One study found that WHTs afforded psychological benefits such as autonomy from feeling empowered by being able to make healthy choices for oneself (Karapanos et al., 2016), similar to research that has argued WHTs may encourage greater health self-efficacy (e.g., Gowin et al., 2019). However, as previously noted, device use may sometimes have negative effects on WHT owners as well [e.g., obsessive tracking, Attig and Franke, 2020, exercising while injured, Russell et al., 2023]. Work from Zimbars (2021) also reported that among Fitbit users, some reported increased anxiety and stress. Future research should build on the existing literature to explore the psychological impacts and emerging concerns from WHTs by examining the potential negative effects of self-surveillancing and quantifying health. Social factors such as those identified in the present study may help to improve health but may also have unintended consequences for some users.

Data availability statement

The datasets presented in this article are not readily available because IRB approval limits the public dissemination of this dataset. Requests to access the datasets should be directed to natalie.pennington@colostate.edu.

Ethics statement

The studies involving humans were approved by the University of Nevada, Las Vegas IRB. The studies were conducted in accordance with the local legislation and institutional requirements. The Ethics Committee/institutional review board waived the requirement of written informed consent for participation from the participants or the participants' legal guardians/next of kin because this was an online survey, participants clicked through to confirm their consent rather than signing their name (avoiding identifiable information).

Author contributions

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The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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