What do we mean by social support? A systematic review of HCI research investigating and designing for social support

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Abstract

Social support contributes to numerous health outcomes and overall well-being, and technology now facilitates many forms of support among both strangers and existing ties. Consequently, Human–Computer Interaction (HCI) research has devoted significant attention to understanding and designing for social support. We conducted a systematic review of 183 papers to take stock of this work. We identified several dominant trends: studies frequently focus on social media and online communities, address health-related topics, and explore interactions among strangers who share an identity or experience; use survey and interview methodologies; and encompass user research without the design or deployment of a new system. Notably, most papers do not explicitly conceptualize social support and tend to frame it as uniformly positive. Our review indicates that, although technology increasingly mediates supportive interactions, HCI lacks consistent definitions of technologically mediated social support. We contribute a synthesis of conceptualizations, point out methodological patterns, and offer directions for strengthening future HCI research in this domain.

CCS Concepts

• **Human-centered computing** → **Human computer interaction (HCI)**.

Keywords

Social Media and Online Communities, Computer-mediated Communication, Health, Relationships

1 Introduction

Social support refers to resources — whether abstract, tangible, or perceived — which are accessed through interactions with the giver to help the receiver achieve their goals [34, 70, 71, 137, 154]. The giver and/or the receiver must perceive the behavior as supportive in order for it to have the intended effect of being helpful. To operationalize and measure such interactions, social support has often been categorized into different types, such as emotional, informational, instrumental, and appraisal support [72]. Extant research has established that such exchange of resources can improve health outcomes, act as healthy coping mechanisms, buffer stressors, and even decrease mortality rates in all demographics [9, 10, 31, 66, 154]. Social support also has social-emotional benefits because it can lead to individuals feeling loved, valued, and connected within their communities [1, 34, 180].

With ever-growing ways for technology to connect people to potential sources of support, the Human-Computer Interaction (HCI) community has increasingly studied technology-mediated forms of social support. This literature is improving our understanding of how technologies can be designed to more effectively facilitate social support, and therefore requires a cohesive focus on what social support is and how we can measure it, in order to consistently design and evaluate technologies toward this intended outcome. Social support research is a diverse area of HCI, with a range of studies connecting the affordances and design of technologies to various forms of social support. For example, on YouTube, the video format can enable rich personal and contextual disclosure about chronic health conditions, fostering informational support (such as sharing knowledge, personal experiences, and advice) and emotional support (such as supportive comments and expressions of empathy) between vloggers and viewers [76]. Social Virtual Reality (VR) can provide a space for Lesbian, Gay, Bisexual, Transgender, and Queer plus (LGBTQ+) communities to find supportive interactions, including building social bonds and exchanging life lessons on navigating their identities both online and offline [96].

When social support is mediated through technology in some way, this introduces new opportunities as well as new sociotechnical considerations to facilitating effective, impactful support. Research has shown that social support is a multidimensional construct encompassing a spectrum of effects from beneficial to detrimental [120, 137, 154], and effective support is contingent upon fit between needs and resources [154]. That is, not all interactions that are intended to be supportive yield positive outcomes, and adverse or neutral effects are possible. Both the people giving and receiving support can feel burdened. Givers may feel pressure from hidden obligations, while receivers not only have to deal with the original barriers in their lives but also with new dependencies that come from relying on others for help. For example, when parents respond to their adult child's job loss by sending money, this support meets the child's immediate financial needs but may also reinstate an earlier sense of dependency, requiring the receiver to navigate both their unemployment situation and the psychological complexities of renewed parental dependence [154]. Both sides can thus experience strain: parents may feel obligated to keep giving, while the adult child may feel indebted. For decades, research has noted that anonymous or stranger support can help to mitigate the sense of indebtedness, shifting both givers and receivers away from strains [154]. Technologies are well-suited to facilitating such varied social support through enabling anonymous interactions, bringing together strangers, fostering new social ties, strengthening established ties, and maintaining relationships at a distance.

Given constantly evolving possibilities with new emerging technologies, HCI research should consider design best practices for how social support can promote well-being. We conducted a systematic literature review to understand how HCI research has approached these topics, characterize current trends in this literature, and identify any gaps or potential opportunities for future research. This paper complements prior systematic literature reviews that have focused on social support in health information systems [123, 172], social support processes in computer-mediated communication (CMC) [136], and social support on social networking sites (SNS) [114]. Our focus, in contrast, is on how social support is conceptualized, investigated, and designed for in HCI research. To design technologies that effectively promote social support, it is essential to build on existing theories and empirical findings. Being clear about what social support means and how it is measured helps us design and evaluate technologies based on this intended impact on our users. Yet research suggests that design researchers often underutilize theoretical frameworks and existing knowledge in their processes [22, 23, 65, 156]. Treating knowledge and theory as design materials and "building with, combining, improving, transitioning" with them enriches technology design [23]. Additionally, our review aims to promote clear conceptualizations of the construct of social support, to foster cumulative knowledge-building, and allow for coherent and transferable design implications across contexts [18, 57]. To therefore provide a clearer foundation for understanding how technologies enable and shape experiences of social support, our first research question was **RQ1. How is social support understood and measured within HCI?**

Beyond examining how social support is conceptualized and measured, our review aimed to characterize how prior studies have designed and evaluated technologies that facilitate social support across different contexts. For example, some studies examined how social media and online communities facilitate social support in health-related contexts by analyzing user-generated content such as videos and comments [76], while others designed prototypes such as smart water bottles that leverage accountability within close relationships, drawing on interviews to evaluate their use [42]. Considering the diverse range of technologies and topics, a comprehensive synthesis is needed to examine how the HCI community investigates, designs, and evaluates technologies aimed at facilitating social support. Furthermore, such a synthesis can reveal which areas have been most extensively studied, and where any gaps remain. To this end, our second research question was **RQ2. How is social support facilitated through technology across different contexts?**

Our systematic literature review included publications in ACM's Digital Library, IEEE Xplore, and Computer Database from 1990 to 2025 relevant to social support, following the PRISMA guidelines [128]. We used content analysis [47, 88] to identify trends in how social support is conceptualized and investigated in the final list of publications identified in our search. Our review makes the following contributions:

- A systematic investigation into the various definitions and conceptual frameworks for social support in HCI research;

- A synthesis of methodological patterns and approaches used in studies of technology for social support, such as phase of system development, research methods, technology types, and how social support is operationalized for system design and evaluation;

- An agenda for future HCI research to expand beyond current investigated topics (such as, health-related or social media), diversify methodologies, and explore new domains of social support;

- Theoretical and ethical implications, including highlighting the multidimensional nature of social support, calling for greater conceptual clarity in HCI research, and surfacing ethical questions about interactions between human and non-human agents.

2 Related Work

2.1 Conceptualizing Social Support Across Disciplines

Contemporary understandings of social support are widely traced to Caplan (1974) [27], Cassel (1976) [28] and Cobb (1976) [34], whose works were mainly concerned with "the health protective functions of people's natural social ties" (p. 307) [58]. In community mental health, Caplan introduced the notion of a support system as an "enduring pattern of continuous or intermittent ties that play a significant part in maintaining the psychological and physical integrity of the individual over time" (p. 7) [27]. Cassel's epidemiological work then highlighted the effectiveness of social support in buffering stressors [28]. Cobb provided one of the first of contemporary widely cited definitions, characterizing social support as information that leads individuals to believe that they are cared

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for and loved, esteemed and valued, and that they belong to a network of communication and mutual obligation. He further argued that such supportive information can moderate the impact of life stress on health and emphasized that it is the recipient's subjective perception of such support [34].

Social support now is a term employed across multiple fields to represent related but distinct constructs [51, 108]. In psychology, scholars such as Shumaker & Brownell (e.g., [154]); House (e.g., [70]); Barrera (e.g., [18]); Cohen (e.g., [37]); and Wills (e.g., [179]), have primarily conceptualized social support in functional terms, focusing on the emotional, informational, or instrumental assistance exchanged within relationships. A classic theoretical contribution in this domain is the stress-buffering hypothesis [39], which posits that social support protects individuals during high-stress situations ("buffering support"), while also having a beneficial influence on well-being regardless of stress levels ("main support"). In communication studies, researchers such as Burleson and Mac-George [26] similarly emphasize supportive behaviors, defining social support as "verbal and nonverbal behavior produced with the intention of providing assistance to others perceived as needing that aid" (p. 374). Sociologist Thoits [161] also highlights functional aspects of social support, describing the instrumental, socioemotional, and informational functions that significant others provide to individuals in distress. Together, these foundational perspectives conceptualize social support as a core determinant of well-being.

2.2 Technology-Mediated Social Support

HCI research extends the traditional notion of social support in the context of face-to-face interaction by increasingly examining how technology can facilitate supportive exchanges. As Walther and Boyd (2002) [174] note, social support is also exchanged through computer-mediated communication, including in "virtual communities" where individuals may not know one another personally and do not interact face-to-face. Recent work also illustrates how technology-mediated social support functions. For example, Barta et al. [20] show that people experiencing pregnancy loss in online support groups read others' narratives to reduce feelings of isolation and validate their grief, and they also exchange specialized knowledge related to loss and recovery. Other studies explore designs that cultivate healthy social relations among residents, such as mobile applications that connect neighbors by displaying nearby users and local activities, allowing them to sign up and participate together [85]. Research on eSports indicates that users helping each other during high-stakes play (instrumental support) and sharing knowledge (informational support) creates trust and respect, which then evolves into deeper emotional bonds and esteem-building, such as self-improvement through mutual learning [50]. Social robots have also been studied as social proxies to facilitate the exchange of emotionally relevant stories between people, with the aim of improving empathy and social connection [152]. Collectively, these technological interventions extend the traditional paradigm of social support, demonstrating how digital systems can mediate supportive interactions across distance and diverse contexts.

2.3 Multidimensional Aspects of Social Support

Social support is a multidimensional construct encompassing a spectrum of effects from beneficial to detrimental [137, 154]. Prior work has examined this complexity by highlighting that support is not inherently positive and often carries hidden costs for both providers and recipients. Mukherjee and Singh conducted a social psychology systematic review grounded in Bandura's Social Cognitive Theory (SCT) and the Job Demands–Resources (JD-R) model to clarify why social support can alternately function as a resource or a burden [120]. Their analysis shows that the effectiveness of social support is contingent on contextual factors, particularly the degree of control an individual has within their social environment and whether the support operates as a demand, an earned resource, or a learned coping behavior. Notably, they identify that imposed or hierarchical forms of support be more harmful than receiving no support at all. Furthermore, one interdisciplinary medical research study found that social support reduces all-cause mortality across demographics only if social support is balanced in terms of receiving and giving [31]. Additionally, public health research of four areas affected by coastal flooding after Hurricane Sandy found that risk tolerance in areas where individuals believe they have strong systems for social support could cause them to not evacuate when they should, potentially increasing adverse outcomes during times of crises [182], further supported by another study on COVID-19, which found social support might increase risk tolerance [144]. Therefore, effective social support depends not simply on offering help, but on delivering support that is appropriately matched to individuals' needs and circumstances. For technology designed to facilitate social support, this underscores the importance of recognizing its multidimensional nature. Researchers and designers must account for the varying forms, functions, and potential costs of support, and develop systems that can adaptively tailor supportive interactions so that they are beneficial rather than burdensome.

3 Methods

We conducted a systematic literature review following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist [128]. In this section, we describe our search strategy, screening, and selection processes that enabled our content analysis method.

3.1 Search Strategy

We searched the primary platforms where HCI research can be found, ACM Digital Library,[1] IEEE Xplore,[2] and Gale OneFile: Computer Science[3], using the following search queries:

- **ACM Digital Library:** `[abstract:("social support*")`
  `OR title:("social support*") OR keyword:("social`
  `support*")]`
  – Boolean query syntax

- **IEEE Xplore:** `("Abstract":"social support*" OR "Document Title":"social support*" OR "Author Keywords":"social support*")`
  - Boolean query syntax

- **Gale OneFile: Computer Science:** `Field [Keyword] "social support*" OR Field [Abstract] "social support*" OR Field [Document Title] "social support*"`
  - Database search interface (not Boolean syntax)

All searches were conducted in the same order to ensure consistency in PRISMA reporting of exclusions (see Figure 1). For example, during the identification phase, we first applied search terms, then filtered by source type (scholarly articles), and finally filtered by publication date.

We searched for publications that included *social support** within abstracts, titles, and/or keywords. We limited our search to the term *social support** to ensure that included papers explicitly engaged with this construct rather than adjacent concepts, such as social connectedness or belonging. We did not search for specific sub-types of social support because typologies in the HCI literature are highly heterogeneous (as shown in Results Section 4.2), making it difficult to identify consistent and meaningful subtype keywords. Restricting the search to *social support** provided a clearer and more reliable basis for capturing relevant work.

We searched for papers published between January 1990 and May 2025. We selected 1990 as the start because HCI was an established research community by then (e.g., with the CHI conference having been held since 1982 [153]), and would have undergone enough transformation to be focused on similar technologies to what we study today (e.g., personal computing, graphical user interfaces), while being on the cusp of a significant turning point for social interaction and the rise of the Internet era [61].

3.2 Screening and Selection

Our data collection procedure consisted of six steps conducted by three of the authors (see Fig. 1):

(1) Our search for the keyword *social support** in abstracts, author keywords, or titles across the three databases yielded 1,025 records.
(2) In line with prior SLRs in HCI [91, 106, 143, 168] and to maintain methodological and theoretical rigor, we excluded 157 records that were not classified as full-page articles from journals or conferences (such as extended abstracts, demonstrations, posters, workshop papers).
(3) Based on the timeline criteria (January 1990 — May 2025), we excluded 5 records that were published prior to 1990.
(4) 20 duplicate records were identified using Excel's and AirTable's deduplication tools [3, 41] followed by a manual verification of the flagged records, as well as a subsequent manual verification of the remaining records during the actual assessment of the records to ensure accuracy.
(5) 4 additional records were removed: 2 were retracted (i.e., formally withdrawn by the publisher for validity reasons) and 2 were not in English.
(6) 9 articles were removed from the corpus because we were unable to access their manuscripts.

Our initial search identified 830 scholarly articles for a detailed review. To remain within scope of our research questions, we removed from the corpus any study that met at least one of the following exclusion criteria:

- studies that did not collect original empirical data (e.g., system concept papers, literature reviews, commentaries, editorials, or opinion pieces);
- studies whose scope and aims were not to understand, design, or evaluate a computing technology (e.g., fintech startups' corporate social responsibility [155]);
- studies that did not adopt human-centered methods (for example, relied solely on simulated mathematical models to predict human behavior [14]);
- studies where social support was not primary motivation for research objective, including where social support was tangential to the research goals or was one of several factors being researched (e.g., [118]).
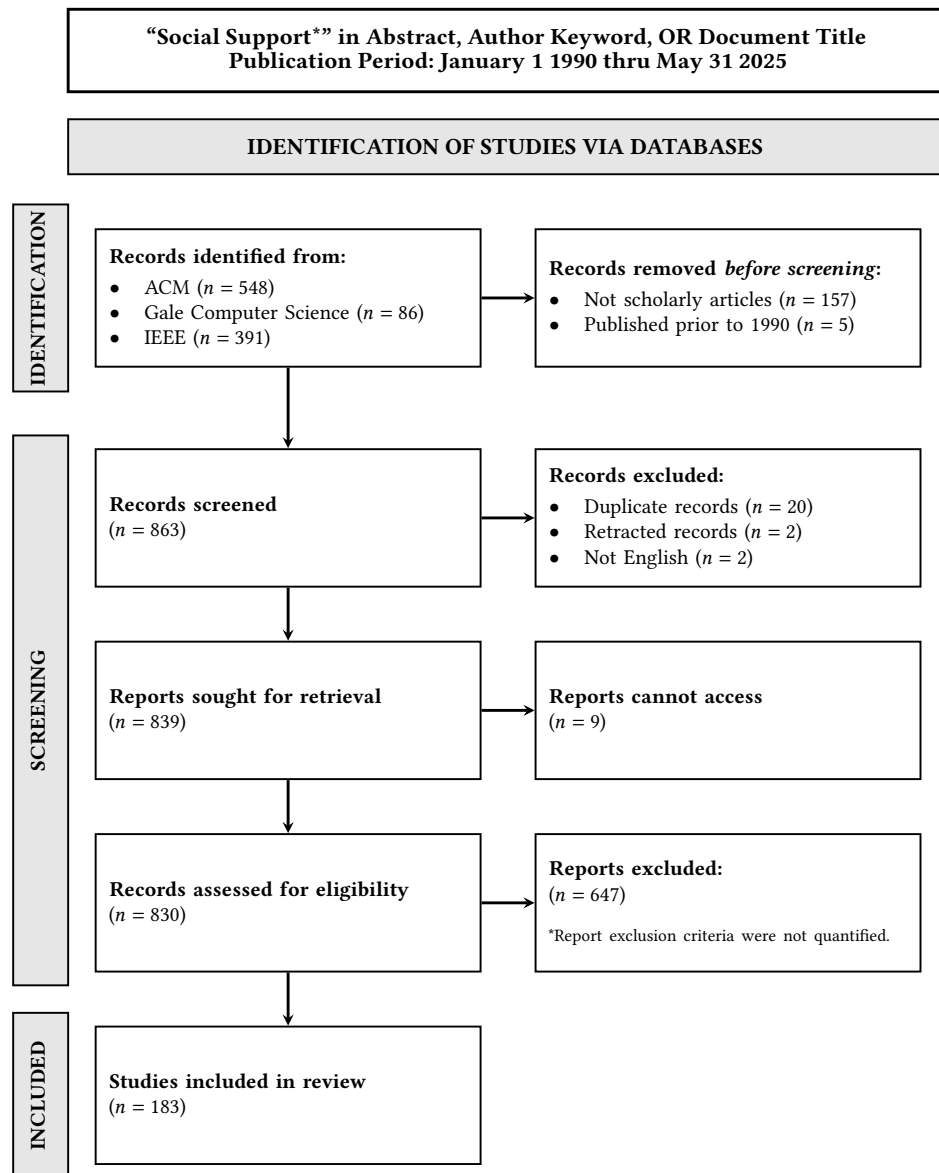
We did not quantify exclusion reasons, as many papers met multiple exclusion criteria simultaneously, making such counts potentially misleading.

During the assessment process, we identified several issues related to metadata mapping and other parameter search limitations related to structural integrity of these three databases. For example, we found that due to the document structure of some studies uploaded to Gale OneFile (Computer Science), even after applying search term filters, the database often returned articles that did not meet the specified search term requirements [100, 107]. To address this, we added an additional exclusion criterion for records that were not properly filtered by the database search engine to include manual review of those not filtered by the prescreening process.

3.3 Data Analysis

We conducted a content analysis [47] of the included studies by breaking them down into small, meaningful units and then organizing those units into categories and themes [47]. We started our analysis with open coding to identify meaningful units that addressed our research questions, focusing on the conceptualization of social support and its implications for design in HCI (refer to Table 1).

To assess inter-rater reliability (IRR), two authors independently and blindly reviewed a stratified random sample of 94 papers, drawn as approximately 10% from included papers (n = 183) and 10% from excluded papers (n = 647). The final sample slightly exceeds 10% in each group due to rounding and subsequent refinements to the corpus. We calculated percentage agreement, following prior systematic reviews that also relied on agreement rates for screening decisions (e.g., [91]). Although percentage agreement and Cohen's kappa are among the most commonly used IRR measures [111], we intentionally did not use Cohen's kappa because it can yield misleadingly low reliability estimates under conditions of high prevalence or skewed category distributions [103]. This issue was relevant in our screening process, where health-related social support studies obviously dominated the corpus, producing an imbalanced distribution. Our agreement averaged 88% across the paper screening process and data analysis stages, which exceeded the minimum
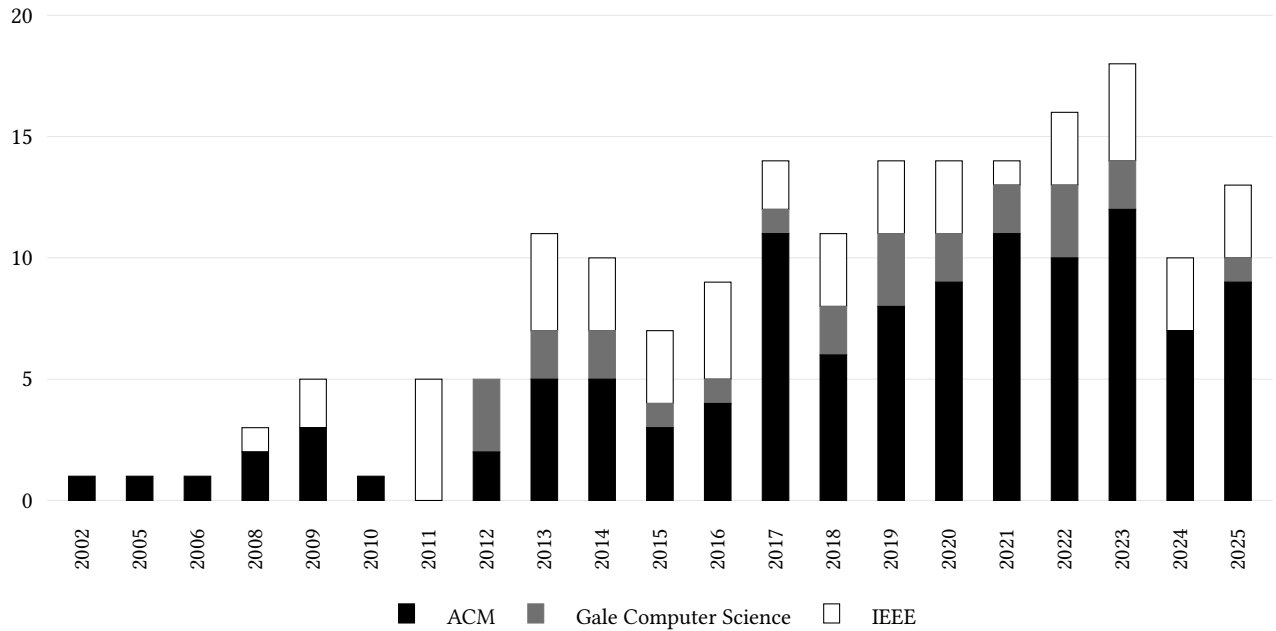
Figure 1: PRISMA Workflow [128] that describes the processes of our screening

"Social Support*" in Abstract, Author Keyword, OR Document Title
Publication Period: January 1 1990 thru May 31 2025

IDENTIFICATION OF STUDIES VIA DATABASES

IDENTIFICATION

Records identified from:
- ACM ($n = 548$)
- Gale Computer Science ($n = 86$)
- IEEE ($n = 391$)

Records removed *before screening*:
- Not scholarly articles ($n = 157$)
- Published prior to 1990 ($n = 5$)

SCREENING

Records screened
($n = 863$)

Records excluded:
- Duplicate records ($n = 20$)
- Retracted records ($n = 2$)
- Not English ($n = 2$)

Reports sought for retrieval
($n = 839$)

Reports cannot access
($n = 9$)

Records assessed for eligibility
($n = 830$)

Reports excluded:
($n = 647$)

*Report exclusion criteria were not quantified.

INCLUDED

Studies included in review
($n = 183$)

percentage agreement level (80%) commonly considered acceptable for most studies [111].

Throughout our analysis, we maintained detailed annotations to identify studies for further discussion and iterations. Any discrepancies in inclusion decisions or due to low IRR agreements were resolved through weekly discussions between authors and the anchor author. After IRR was calculated, analysis continued with refining final codes and themes toward the most useful insights, resulting in some codes, categories, and criteria being combined or dropped for clarity. Thus, we excluded 647 studies and included 183 studies that focus on social support in HCI research.

3.4 Limitations

Our study searched for common sources of HCI research (ACM Digital Library, IEEE Xplore, and Gale OneFile: Computer Science). As a result, social science-oriented databases such as SAGE Journals and Taylor & Francis Online were not included, and some relevant HCI studies published in interdisciplinary venues may have been missed. Additionally, we focused specifically on the term *social support** to effectively scope our review, but this may have excluded studies examining related concepts that include social capital, social connectedness, and supportive behaviors, as well as social support subtypes that did not explicitly use *social support** in their articles.

Figure 2: Included Publications by Database ($n = 183$)

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Table 1: Coding Framework Aligned with Research Questions

Code Category	Description & Extracted Content	Example Codes
Ways of Conceptualizing	Social support conceptualized for study	definition; typology
Conceptualization Citations	Sources used to justify conceptualization	social support theory; not cited
Phase of System Development	Research phase of the study	user research; design; field deployment
Research Methods	Data collection methods used	interviews; surveys; ethnographies
Technology Types	Type(s) of technology the study examined	social media and online communities
Operationalization	How social support is operationalized for system design and evaluation	peer support among strangers
Multidimensionality	How do studies conceptualize and operationalize the multidimensionality of social support	positive, negative, neutral
Social Support Exchange	Actors exchanging social support	humans; computers supporting humans
Contexts for Social Support	Topic(s) explored in technology's usage	health-related; marginalized groups
Demographics	Context(s) of persons being studied	medical conditions; employment
Country of Study	Location(s) of participants	United States; China; United Kingdom

*Studies may include multiple codes in a category or none.

As justified in our search strategy in Section 3.1, these search decisions were necessary to review feasibly and remain within the scope of our research questions. Future work could explore these adjacent constructs to provide complementary perspectives on how HCI and allied fields address various forms of social well-being through technology mediation. Finally, though we conducted IRR checks and held weekly discussions to maintain reflexivity throughout the data analysis, our review is inherently subjective. However, our goal was to meaningfully categorize and explain trends in the literature, and this type of interpretation is a strength of qualitative methods such as the content analysis that we employed.

4 Results

4.1 Publication Trends

The publication years of the included articles are shown in Figure 2. Although our search covered 1990 onward, the earliest included article was published in 2002. Publication counts increase over

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time, with most articles appearing in or after 2015 (77%, $n = 140$). This growth aligns with developments in computing, such as the convergence of the Internet and mobile eras, and the emergence and maturation of social media [61] – thus, research focus around social support reflected increasing opportunities for these technologies to facilitate it.

4.2 Conceptualization of Social Support (RQ1)

We first examined what the term *social support* refers to in HCI research. We considered the term **conceptualized** when a paper stated what counts as social support for its own study (for example, a definition or set of categories). Among 183 included papers, 50% ($n = 92$) of the papers conceptualized the term "social support." Below, we outline the ways in which these papers conceptualized social support.

We considered the term **not conceptualized** when a paper introduced the term "social support" but did not provide a specific definition (refer to Figure 3). Notably, 50% ($n = 91$) of papers used the term "social support" without providing an explicit conceptualization. These papers only described the potential outcomes of social support, for instance, "social support can improve the person's psychological health... especially for people who feel lonely" (p.132) [163] and "social support is an important element in helping novice programmers to do better" (p.89) [101].

4.2.1 Ways of Conceptualizing Social Support. We identified a few approaches used for conceptualizing social support: offering a typology of different forms in which support can be provided, citing established theory or providing a definition, conflating conceptualization of social support with outcomes used to measure it, or a combination of these (refer to Figure 3).

- **Categories/Typologies.** 30% of the included papers ($n = 55$) provided a typology conceptualization of social support, explaining social support as different forms/categories of support (for example, emotional, informational, tangible). A frequently cited typology work from Cobb (1976) [34] categorized support as esteem, network, and emotional support (refer to Table 2). Across these papers, we identified 31 distinct support types, including Affirmative [82], Collective and Individual [169], Companionship [160], Educational [68], Financial [181], Functional [87], Nurturant [55], Spiritual [141], and so forth. For example, spiritual support was conceptualized within Black churches to better understand how support manifests within these religious institutions [141], while a study of Indian low-income schools used collective and individual support subtypes to better understand how teachers might feel supported through case management services [169].

- **Definitions.** 27% of papers ($n = 50$) explicitly defined social support. Some of these papers engaged with theoretical work to develop their definition (such as [4, 52, 158]). A commonly adopted definition from a widely-cited theory, Shumaker & Brownell (refer to Table 2), described social support as "an exchange of resources between two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient" (p. 13) [154]. Beyond using
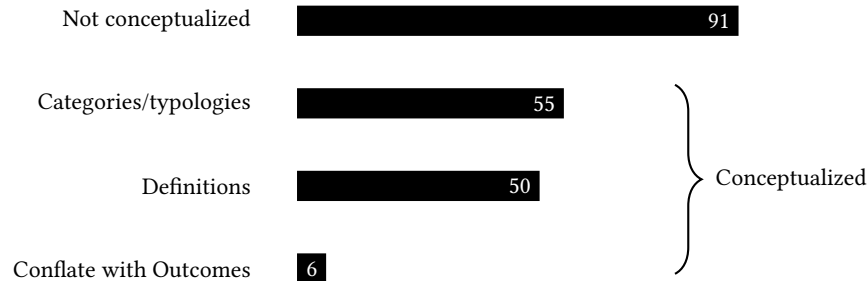
an established definition, some studies provided their own definition of social support to better fit their research aim. For example, one study offered its own definition without citing any theory or study, describing social support as "assistance and resources that individuals provide to others through social relationships" (p.3) [30].

- **Conflate Conceptualization with Outcomes.** 3% of papers ($n = 6$) conflated the concept of social support with outcomes used to measure it. In these cases, behaviors or activities used as an indicator of social support were framed as the concept itself. For example, one study examined small talk — brief, informal social interaction — describing it as "a form of social interaction that is important to building interpersonal trust" (p. 68) [150]. In this case, social interaction was used interchangeably with social support. One study on crowdfunding conceptualized social support as "the actual performance of crowdfunding projects attracting social supporters" (p.570), which appears to showcase that they conflated the concept with their study's aims to examine "the relationship between the promoter value, project value, project team value, project comment times and crowdfunding results" (p. 569) [48].
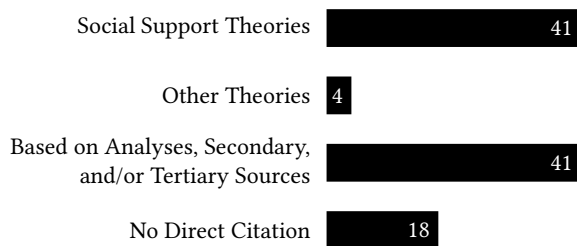
Overall, findings revealed that approximately half of the papers did not conceptualize social support, instead only focusing on the intended outcomes of social support. For the half that did conceptualize what they considered to be social support, we next outline the kinds of works they cited to ground their work in social support theory.

4.2.2 Works Cited in Conceptualizing Social Support. Among 92 papers that conceptualized social support, we distinguished the types of citation sources authors adopted for their explanation: established general theories of social support (social support theory), general theories modified for social support (adjacent theory), empirical analysis and review/synthesis papers (analyses, secondary, and/or tertiary sources), as well as no direct citation (Fig. 4).

- **Social Support Theories.** Most commonly, 45% of papers (41/92) cited established social support theory for their conceptualization. We found that 31 distinct theoretical works were cited in our dataset, and Shumaker & Brownell's 1984 work [154] was the most frequently cited (refer to Table 2).

- **Other Theories.** A small number of papers (4/92, 4%) did not cite social support theory, but did draw on other theories that explained concepts closely related to social support: enacted support, small talk, and online interaction. Two papers [19, 20] cited Goldsmith's work on enacted support [56], which she defines as "what individuals say and do to help one another" (p. 13) and is sometimes considered a subtype of social support; one paper [150] focused on small talk (informal, light conversation), citing [29]; and another [74] focused on interactions among online learners, citing [67]. Thus, while social support was discussed in these papers, the theory cited focused on other — though relevant — concepts.

- **Analyses, Secondary, and/or Tertiary Sources.** 45% of papers ($n = 41/92$) grounded conceptualizations in analysis

Figure 3: Explicit social support conceptualizations (n = 183)

Not conceptualized	91
Categories/typologies	55
Definitions	50
Conflate with Outcomes	6

Conceptualized

*19 articles are conceptualized with multiple considerations, meaning that their conceptualizations of social support were not restricted to a single approach. For example, [98] drew on both categorical typologies and definitional frameworks.

Figure 4: Explicit citations for conceptualization (n = 92)

Social Support Theories	41
Other Theories	4
Based on Analyses, Secondary, and/or Tertiary Sources	41
No Direct Citation	18

*11 articles had multiple codes.

papers, such as social media analyses and survey analyses (e.g., [11, 44]), systematic review papers (e.g., [59, 62]), their own analysis — that is, conceptualizing solely with their own data, a professional dictionary [6], and a psychometric analysis paper [45].

- **No Direct Citation.** Lastly, 18 of 92 papers (20%) provided a social support conceptualization without citing any sources. For example, one study conceptualized social support as "...the actual performance of crowdfunding projects attracting social supporters" (p.570) [48], but did not put a citation to support it.

Taken together, these findings show that, to conceptualize social support, many HCI papers rely on well-established theory, empirical or reference materials, adapt other theories, and some conceptualize the term without citing a source. This clarifies how conceptualizations are grounded before we turn to how studies investigate and design for social support.

4.3 Technologies for Social Support (RQ2, Part 1)

Next, we describe how the HCI community studies and designs technologies for social support, based on the phase of system development represented in the literature, the research methods used, and the technology types included in this research.

4.3.1 Phase of System Development. We identified the primary stage of system development represented in each paper, from studying the use of existing systems only, to early-stage discovery of user needs, design work, and deployment of a novel system. These phases are shown in Figure 5. When multiple of these stages were covered in a paper, we focused on the farthest stage (e.g., deployment is farther than design). 69% (n = 126) of papers focused on early-stage discovery of user needs: 62% of papers (n = 114) focused on use of existing systems, most commonly social media platforms (e.g., [92, 116, 183]) while 7% of papers (n = 12) conducted needs assessment-style user research, such as collecting data to understand people's needs and contexts for the purposes of informing the design of a novel system by the authors (e.g., [134, 147, 175]). 7% of papers (n = 13) included design work such as ideation, sketching, prototyping, or participatory design workshops (e.g., [79, 127, 159]). Approximately 10% of papers (n = 18) evaluated a system designed by the authors through lab studies, such as usability testing (e.g., [102, 125, 151]). 14% of papers (n = 26) involved field deployment of a novel system, evaluating designs with users in their daily lives and real-world settings (e.g., [46, 95, 152, 169]). Thus, social support was most often studied on existing platforms, and a minority of papers involved novel system design and deployment.

4.3.2 Research Methods. With regard to research methods (refer to Figure 6), we found that the most common was surveys, employed by 69 papers (38%). 62 papers (34%) involved interviews (e.g., [94, 113]). 45 papers (24%) conducted digital text analyses of online content such as social media posts and comments (e.g., [76, 142]). Other methods reported were: real-world testing and field evaluation (n = 28, 13%) (e.g., [74, 117]), workshops for ideation or
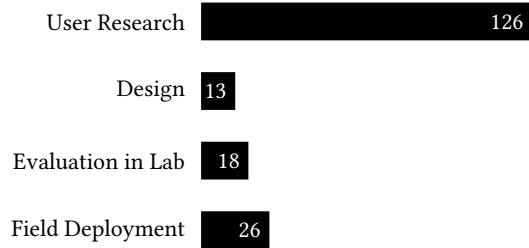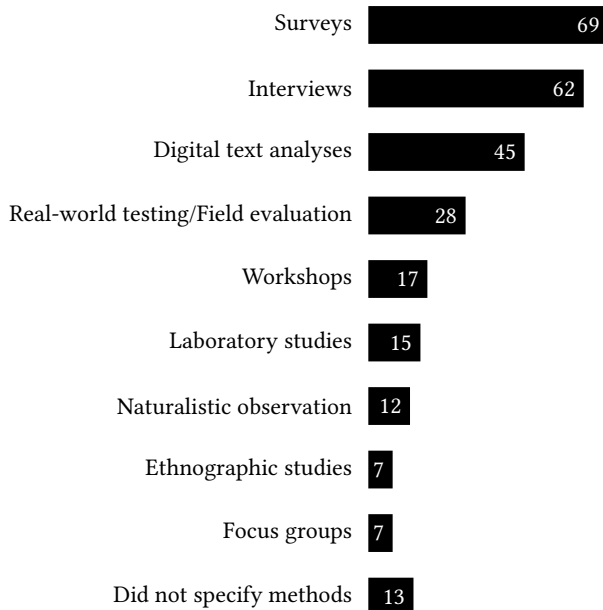
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Table 2: Overview of 31 Social Support Theoretical Works Cited in HCI Research

Citation	Definition	n , % of 41
Shumaker & Brownell, 1984 [154]	"an exchange of resources between at least two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient." (p.13)	*n* = 9, 22%
Cobb, 1976 [34]	Information which leads to belief that one is cared and loved; esteemed and valued; and/or belonging to a network of communication and mutual obligation. This framework showcases how emotional, esteem, and network support are operationalized through clear boundaries, although admittedly limited to medical contexts and subjective perceptions of such information that is ascribed as supportive.	*n* = 6, 15%
Barnes & Duck, 1994 [17]	Appears to categorize social support as *emotional, informational, tangible,* and *appraisal support*, with no citation. This particular work leaves social support undefined, instead focusing on its benefits and how it shows up in this context.	*n* = 4, 10%
Bambina, 2007 [16]	Appears to categorize online social support into emotional, informational, and companionship. Broadly, social support appears otherwise undefined, but cites Cobb [34] for overall social support understanding.	*n* = 3, 7%
Barrera, 1986 [18]	Appears to give intellectual history of social support up until this point (1986) and divides into subtypes, social embeddedness, perceived social support, and enacted support, to argue against broad conceptualization attempts.	*n* = 3, 7%
Cohen et al., 2000 [36]	Same book as Lakey & Cohen, 2000 (different chapter). "...the social resources that persons perceive to be available or that are actually provided to them by nonprofessionals in the context of both formal support groups and informal helping relationships" (p. 15)	*n* = 3, 7%
House, 1981 [70]	"...flow of emotional concern, instrumental aid, information, and/or appraisal (information relevant to self-evaluation) between people" (p. 26)	*n* = 3, 7%
Cohen & Wills, 1985 [39]	No broad definition is provided. Social support is defined narrowly instead as functional (relational) and structural (resources) support to better understand its implications for buffering model and associations with overall well-being.	*n* = 2, 5%
Lakey & Cohen, 2000 [89]	Same book as Cohen et. al, 2000 (different chapter). examines "social support research [through]: (1) the stress and coping perspective, (2) the social constructionist perspective, and (3) the relationship perspective" (p. 40). Does not define social support broadly in this chapter.	*n* = 2, 5%
Thoits, 1986 [161]	"...functions performed for a distressed individual by significant others such as family members, friends, co-workers, relatives, and neighbors. These functions typically include instrumental aid, socioemotional aid, and informational aid (House, 1981 [70]; Turner, 1983 [165])."	*n* = 2, 5%
Papers Cited Once	Other papers only cited once. i.e., [25, 27, 35, 37, 38, 43, 71–73, 83, 86, 90, 124, 146, 166, 167, 170, 176–179]	*n* = 22, 54%

*12 studies cited more than one theoretical work. As individual papers can cite multiple theories, row percentages may sum to more than 100%.

feedback (*n* = 17, 9%) (e.g., [104]), and lab studies such as usability tests (e.g., [162]) or Wizard-of-Oz (e.g., [42]) (*n* = 15, 9%). Naturalistic observation (observing everyday activities without intervention) was used in 12 papers (7%) (e.g., [63]). Ethnographic studies (e.g., [186]) and focus groups (e.g., [127]) were the least common (each 4%, *n* = 7). Lastly, 8 studies (4%) did not clearly specify their data collection methods, while 5 studies partially specified their data collection methods (only explicitly elaborate part of their methods) Nearly half of the papers (41%, *n* = 75) used more than one method, and surveys (38 of 69 studies) and digital text analyses (29 of 45 studies) were the most likely to be used without companion methods (e.g., [98, 135]).

Figure 5: Research phases of system development (*n* = 183)

Phase	Value
User Research	126
Design	13
Evaluation in Lab	18
Field Deployment	26

Figure 6: Research methods of data collection (*N* = 183)

Method	Value
Surveys	69
Interviews	62
Digital text analyses	45
Real-world testing/Field evaluation	28
Workshops	17
Laboratory studies	15
Naturalistic observation	12
Ethnographic studies	7
Focus groups	7
Did not specify methods	13

4.3.3 Technology Types. Most papers focused on social media and online communities (*n* = 117, 64%), such as social networking sites (e.g., [126]) and the blogosphere (e.g., [142]). 30% of papers studied Information and Communication Technologies (ICT) (*n* = 55) (e.g., [69]). Other technologies we identified in our review were conversational Artificial Intelligence (AI) (*n* = 16, 9%), such as social robots (e.g., [160]) and chatbots (e.g.,[15]); mobile applications (*n* = 14, 8%) (e.g., [105]); physical/ubiquitous computing (*n* = 14, 8%), such as wearable devices (e.g.,[125]) and Augmented Reality (AR)/VR

(e.g.,[138]); games (*n* = 4, 2%) (e.g., [101]); and crowdfunding (*n* = 4, 2%) (e.g.,[48]). See Table 3 for definitions and example papers.

4.4 Kinds of Support and Context of Support (RQ2, Part 2)

Finally, we describe the kinds of social support and context of social support that we identified in the HCI literature. We characterize the literature based on how papers operationalize social support for system design and evaluation, specifically by examining social support operationalization, interaction patterns, explored topics, study demographics, and countries studied.

4.4.1 Operationalization of Social Support for System Design and Evaluation. We considered how social support was operationalized as described across literature's Methods, Results/Findings, Discussions, and Conclusions. By operationalization, we specified how studies presented social support in their design and the study itself. In light of our review, we found that social support often acted as the study's aim itself, to express and influence positive emotions, and/or to facilitate and/or understand particular outcomes, such as continued use, trust, and decisions (see Table 6). In particular, we found most papers operationalized social support as *peer support among strangers* (e.g., individuals trying to cease smoking behaviors turn to online strangers for support [189]; mothers with postpartum depression seek forums to locate stranger peer support online [133]; Chinese teenagers and young adults using chatbots which mimic peer behavior to enable supportive, introspective interactions [15]) (*n* = 88, 48%) and *facilitation of relational support* (e.g., individuals using smart water bottles to stay connected with one another as a supportive form of accountability [42]; Black churches using spiritual fellowship as a way to connect and support one another [141]; social robots mimicking connection to simulate supportive behaviors for varying needs [160]) (*n* = 74, 40%).

4.4.2 Multidimensionality. In the included corpus, we identified only one included study that explicitly discussed social support's potential negative outcomes, which was to health anxiety on social media use [191]. Other studies instead focused on social support's benefits (e.g., [96]) and considered social support through supportive behaviors [75] that achieved desirable operationalization. In our analysis, we moved beyond keyword-based identification and instead closely examined the narrative accounts within the papers to understand how negative outcomes of social support were addressed. Even when negative outcomes were mentioned, they were frequently attributed to limitations of the technologies rather than examined as inherent, multidimensional consequences of the social support processes themselves (e.g., [19, 112, 175]).

4.4.3 Social Support Exchange. We specified three different ways that social support can be exchanged: (1) 90% of studies (*n* = 163) explored how social support is exchanged between human actors (e.g., humans exchanging parenting advice [7]); (2) 8% of studies (*n* = 15) examined how social support is given to humans by technology itself, including chatbot or conversational agent, in place of another human (e.g., simulating friendship [152], simulating healthcare supportive roles [82], and simulating teaching instructor [93]); and (3) 3% of studies (*n* = 5) explored both exchange types

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Table 3: Types of Technology Studied (*n* = 183)

Type	Definition	*n*, % of 183
Social Media & Online Communities Examples: [20, 49, 133, 141]	Digital platforms designed for the primary purpose of facilitating community-building through collective creation, sharing, and/or circulation of content among users. These platforms afford persistent social spaces (e.g., feeds, threads, groups), user-generated content, and reciprocal social exchange.	*n* = 117, 64%
Information & Communication Technologies Examples: [81, 115, 175]	Technologies designed primarily for the transmission of information and/or to enable communication between two or more people, without the express purpose of community building.	*n* = 55, 30%
Conversational AI Examples: [80, 152]	Technologies designed and trained to simulate human-like dialogue, enabling users to interact as they would converse person-to-person.	*n* = 16, 9%
Mobile Application Examples: [93, 169]	Computing applications which are designed to run on mobile devices.	*n* = 14, 8%
Physical/Ubiquitous Computing Examples: [42, 96, 102, 125]	Physical objects or devices which have computing capabilities, and whose primary function, ubiquity, is to seamlessly integrate virtual environment into the real-world. Subtypes from data included augmented & virtual reality; social robots; and wearable devices.	*n* = 14, 8%
Video and Computer Games Examples: [94, 121]	Computing applications whose primary focus was entertainment with interactive functions to engage in play. One study explored adaptive technology to enable games in rehabilitation settings.	*n* = 4, 2%
Crowdfunding Examples: [48, 181]	Digital platform that enables donation of services, goods, and other resources. Specifically, crowdfunding were to support live streamers (*n* = 2); medical costs (*n* = 1); and projects (*n* = 1).	*n* = 4, 2%

*36 articles were coded more than once. As technology can consist of multiple types, row percentages may sum to more than 100%.

Table 4: Operationalizations of Social Support (*n* = 183)

Operationalized as...	*n*, % of 183
Peer support among strangers	*n* = 88, 48%
Influence and facilitate relational support	*n* = 74, 40%
Influence and facilitate behaviors	*n* = 47, 26%
Online advice for shared lived experiences	*n* = 37, 20%
Influence and facilitate positive emotions	*n* = 24, 13%
Influence and facilitate self-disclosure	*n* = 24, 13%
Trust's role in influencing intentions	*n* = 18, 10%
Influence and facilitate self-efficacy	*n* = 15, 8%
Simulated communication as parasociality	*n* = 15, 8%
Collective expert-guided peer support	*n* = 13, 7%
Facilitate grief, trauma, and/or similar	*n* = 12, 7%
Facilitate acknowledgments and gratitude	*n* = 11, 6%
Facilitate and coordinate tasks	*n* = 11, 6%
Facilitate continued usage of product	*n* = 11, 6%
Building a relationship without formal ties	*n* = 6, 3%
Influence and facilitate commerce decisions	*n* = 6, 3%
Online relationships compared to offline	*n* = 6, 3%
Coordinate and customize support	*n* = 5, 3%

*127 articles were coded more than once. As individual papers can use multiple operationalizations of social support, row percentages may sum to more than 100%.

(e.g., romance game that examined gamers interactions between themselves and the non-human main character of the game [94]).

Thus, technologies are primarily explored for how they mediate supportive behaviors between humans; however, included studies reflect this emerging field of replicating such behaviors by technologies, as well as how users themselves can create their own forms of replication.

4.4.4 Context for Social Support. We investigated the topics explored in HCI research, focusing on the contexts in which technologies were used to provide social support (see Table 5). We only coded papers that explicitly mentioned their topics, and we found 26 papers without clear topics — for example, those that mentioned social interaction without specifying the context of social support [4, 33, 152].

We found that more than half of the studies considered health-related (107/157, 68%) topics, which examining supportive behaviors for health-related issues (e.g., diagnoses [135] and exercise [117]). 11% of papers (18/157) focused on marginalized groups (e.g., LGBTQ [96] and individuals with HIV [79]). 10% of papers (16/157) focused on the learning, which is related to educational topics (e.g., language learning through mobile applications [150]). Additionally, 8% of papers (12/157) focus on the topics of simulating relationships, in which individuals form relationships with conversational agents, robots, and other technologies that mimic human relationships [94, 110, 115].

8% of papers (12/157) investigated technology in the workplace (e.g., [24] and [139]). 9 out of 157 papers (6%) explored the commerce topics, such as donating [181]. Only a small number of papers

investigated the parenting context (2/157) and habit-related topics (1/157). See Table. 5 for definitions and example papers.

4.4.5 Demographics. We examined participant demographics reported in the included papers, including health conditions, educational settings, gender and racial identities, age ranges, and certain platforms (e.g., TikTok) /technologies (e.g., VR) users (see Table 6 for all demographic contexts). Participants with health conditions were the most common ($n = 50$, 27%), such as individuals with autism disorder [186], cancer diagnoses [135], and mood disorders [99].

Participants who continued university learning were situated in 13% studies ($n = 23$) (e.g., [125]). 21 studies (11%) focused on the population of gender and racial identities (e.g., [54, 164]). For age-related studies, we found 13% studies focused on young people (10-25) ($n = 23$) and 5% studies focused on older adults (over 55) ($n = 9$).

2 articles each ($n = 4$, 2%) did not define their target demographics [173], or they generalized the findings to all internet users [33].

In addition, 8 articles (4%) studied users of a particular platform or technology, with 3 articles focused on particular platforms (e.g., Reddit [92] and TikTok [19]) and 5 articles focused on particular technology types (e.g., VR [110] and robots [160]).

4.4.6 Country of study. By this section, we mean the geographic location where data were collected, participants were recruited, or deployment was conducted. In general, we were unable to identify countries of 30% studies ($n = 54$) (e.g., [12]), and an additional 2% studies ($n = 3$) were partially unidentifiable due to unclear or unreported findings [119, 131, 188]. Among studies with identifiable country information, 34% of studies ($n = 62$) recruited participants in the United States, including 1 partially unidentifiable study, and 13% of studies ($n = 24$) recruited participants from China, including 1 partially unidentifiable study. Likewise, 23% of studies ($n = 43$) focused exclusively outside of the United States and China, such as Türkiye [53], South Korea [82], and Denmark [125]. Markedly, no study was conducted in Africa, and there was only one study with one participant who resided in South America (Colombia) [187].

5 Discussion

We reviewed 183 HCI studies related to social support and technology. By clarifying how social support has been conceptualized and operationalized in HCI, this systematic literature review can guide the design of future studies and inform the design of technologies that more effectively support human connection and well-being. In the following, we highlight research gaps and future research directions for the HCI community by calling for: (1) greater clarity in how social support is conceptualized, (2) engaging nuances beyond positive assumptions of social support, (3) noticing ethical implications about non-human and hybrid interactions of support, and (4) diversifying methodological approaches and contexts when investigating and designing for social support.

5.1 Ongoing Challenges with Conceptualization

5.1.1 Limitations in Social Support Typologies. We found that HCI papers most commonly conceptualized social support through categories/subtypes (see subsection 4.2.1), such as emotional and informational support, though the specific typologies varied depending on the work cited. For example, Cutrona and Suhr [44] classify social support into *informational, tangible, esteem, emotional,* and *network support*, while Bambina [16] uses the three categories of *informational, emotional support,* and *companionship*. The same supportive behavior could therefore be classified into multiple categories depending on the framework adopted by researchers, potentially creating conceptual confusion. For example, Adams et al. [2] designed a mobile health app which enabled users to share health decisions (e.g., going for a walk); participate in group chats; and exchange supportive encouraging, positive, or informational messages — categorizing these behaviors using Cutrona and Suhr's framework [44] mentioned above. By contrast, Li et al. [97] examined online health communities that supported patients' decision-making around diagnosis and treatment, with activities such as asking questions and sharing advice — categorizing these user behaviors through Bambina's framework [16] mentioned above. Therefore, this leads to variation in how social support is understood, contextualized, and categorized, depending on which framework researchers adopt. Additionally, although typologies help in concept formation, measurement refinement, dimensionality exploration, and the organization of explanatory claims, simply listing categories without clearly stating the overarching concept also raises questions about conceptual clarity [40].

In addition to differences in researchers' adoption and application of typologies, the inherent nature of typologies themselves poses further challenges. Previous studies have noted that the terms used to categorize social support appeared to be interchangeable and imprecise, leading to overlaps across categories [13]. For instance, Cohen and Wills [39] observed that *esteem support* is frequently treated as a form of *emotional support*, since affirmations of worth and acceptance inherently convey empathy and reassurance. Similarly, other studies found that when one type of support is provided, another conceptually distinct type may be offered simultaneously, either explicitly or implicitly [145, 149]. An example could be the "cheerleading" supportive messages like "Excellent! Keep it up!", which can be considered both encouraging (emotional support) and complimentary (esteem support) [2]. Therefore, a clear conceptualization of the type of social support being addressed is essential for the design of technology interventions. Without it, designers risk creating systems that do not adequately afford, enable, or facilitate the intended form of support. This lack of clarity also undermines the ability to evaluate whether a technology achieves its goals, making it difficult to assess effectiveness or identify areas for improvement.

5.1.2 Definitional Incoherence in HCI's Use of Social Support Theory. As Table 2 shows, there is no single, universally adopted definition of "social support" in HCI research. Shumaker and Brownell [154] (22%) and Cobb [34] (15%) are the most frequently cited sources. Across the most-used works (e.g., [16, 17, 34, 35, 154]), social support is commonly treated as a relational phenomenon

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Table 5: Social Support Contexts: Concrete Topics of Technology Investigated (n = 157, 86%)

Topics	Definition	n, % of 157
Health-related	Examining supportive behaviors for health-related issues, such as diagnoses [135], mental health concerns [77], community health crises [84], and behavioral modifications, which include diet [32], smoking cessation [132], and exercise [117].	n = 107, 68%
Marginalized Groups	Research on identities of individuals that explicitly focused (as their research aim) on lived experiences of identity-related social and political challenges, such as LGBTQ feeling isolated [96] or individuals with HIV experiences of stigma at healthcare clinics [79].	n = 18, 11%
Learning	Educational, construed broadly, such as studies of classroom management of teachers [169] or language learning through mobile applications [150].	n = 16, 10%
Simulating Relationships	Forming relationships with conversational agents [129], robots [160], and other technologies that mimic human relationships [94, 110, 115].	n = 12, 8%
Workforce	Studies which aim to understand supportive behaviors related to the workforce, such as studies of networking and coping after job loss on Facebook [24] or how business owners use conversational AI [139] .	n = 12, 8%
Commerce	Research which seeks to understand how social support and commercial ventures intersect, such as why online community members might engage in commerce actions [64] or why people donate to live streamers [181].	n = 9, 6%
Parenting	Specific investigation of how parents interact and seek information on child-rearing and similar understandings, such as understanding how fathers support one another on social media [7].	n = 2, 1%
Habit-related (non-Health)	Behavioral modification of habits that are not related to health [151].	n = 1, 1%

*20 articles were coded more than once. As technology can consist of multiple topics, row percentages may sum to more than 100%.

Table 6: Demographic Contexts Studied (n = 183)

Context	n, % of 183
Health Conditions	n = 50, 27%
Continued and University Learning	n = 23, 13%
Young People (10-25)	n = 23, 13%
Gender and Racial Identities	n = 21, 11%
Informal Caregiving	n = 15, 8%
Employment	n = 11, 6%
Fitness, Diet, and Wellness	n = 9, 5%
Older Adults (Over 55)	n = 9, 5%
Platform / Tech Type Specific	n = 8, 4%
Social Media Usage	n = 8, 4%
Trauma, Grief, & Loss Related	n = 8, 4%
Substance Usage (e.g., Tobacco)	n = 7, 4%
Public Health Related	n = 6, 3%
Donations and Purchases	n = 5, 3%
Migration	n = 4, 2%
General (i.e., Internet Users)	n = 2, 1%
People who Moved	n = 1, 1%
Veterans	n = 1, 1%
Unclear or Not Defined	n = 2, 1%

*26 articles were coded more than once. As studies can have multiple demographics, row percentages may sum to more than 100%.

that involves the exchange of resources or functions (emotional, informational, instrumental/tangible, appraisal, and companionship) and is linked to well-being or coping with stress. However, more than half of all theoretical works are cited only once, suggesting that, in the included corpus, HCI studies often borrow concepts opportunistically rather than building cumulatively on a coherent theoretical lineage. The conceptual ambiguity limits the understanding of how theories, technological contexts, and design features collectively shape social support experiences. In the included corpus which conceptualized the social support, papers rarely describe how theoretical constructs inform specific design decisions, system features, or the social dynamics that technologies aim to support. As a result, the pathway from theoretical framing to implemented design remains unclear. This gap presents an opportunity for future research to explain more explicitly how theories can guide design choices and specify the support functions that particular features or technologies are meant to deliver. The field would benefit from developing clearer principles for when and how to draw on social support theory in order to justify design rationale and shape the features that mediate supportive interactions.

5.1.3 Dearth of Explicit Conceptualization and Implications. Our results revealed that around half (49%) of the included papers did not explicitly conceptualize social support — they neither provided a definition, articulated subtypes/categories, nor conflated the concept with outcomes used to measure it (see subsection 4.2.1). This lack of explicit conceptualization poses challenges, as different studies may use the term in different ways. For example, studies on workflow and collaboration [139, 140] treated social support differently: one [140] emphasized task management, delegation, and progress monitoring, while another [139] focused on emotional

encouragement and knowledge sharing. Therefore, findings and design guidelines from similar contexts might be difficult to synthesize and interpret effectively. Overall, future work should clearly specify the context and definition of social support, and be precise about the categories investigated, so that future studies can build on consistent and well-grounded conceptualizations.

5.2 Acknowledging Multidimensionality

Social support has been viewed predominantly as a positive resource in the HCI literature [109], especially when it comes to buffering stress and improving health outcomes [9, 10, 31, 66], while its potential costs for both givers and receivers are often overlooked [120]. For instance, a supervisor's supportive action in the workplace may be intended to help but perceived by the receiver as unhelpful or even harmful, leading to lower competence-based self-esteem, greater work-related burnout, and other negative outcomes [60, 184]. Additionally, previous studies [21, 109] have highlighted that there is a continuum from social support to harm (such as mistreatment, neglect, and abuse), and given that social support is based on how interactions are perceived by both giver and receiver, it is possible for the same behavior to be viewed as positive by one person and harmful by another. Therefore, it is essential to be aware of and account for the multidimensional nature of social support.

In our review, we found only one included paper [191] that explicitly discussed the potential negative outcomes of social support. Zhang et al. [191] explained that social support —through investigation of seeking and sharing health-related information on social media — may reduce feelings of loneliness while also potentially triggering rumination. Remaining literature that we reviewed studied social support for positive outcomes, while noting negative outcomes as either the result of other technologies or unsupportive behaviors (e.g., [130]). This suggests that this construct is treated as almost entirely positive in HCI research, assuming that any type of social support, provided through any means, will result in positive outcomes. As a result, the multidimensional effects and, subsequently, the social support's nuanced nature are neglected. Therefore, future studies should consider the complex nature of social support rather than evaluating purely based on its intended benefits. Researchers should also avoid imposing their own notions of what counts as supportive, and instead defer to users' own definitions, perceptions, and experiences of social support, given that supportive behaviors are determined by giver and/or receiver [34]. We further suggest that future work make explicit how their design features shape the supportive interaction patterns embedded in technological systems, helping ensure that these systems do not inadvertently create a burden. More broadly, we encourage HCI researchers to manage the multidimensionality of social support not only as a measurement concern, but as a lens for determining what kinds of support technologies should or should not attempt to provide.

5.3 Highlighting Ethical Concerns Further

While most of the papers (90%) in our sample focused on how technology facilitates interactions between people, 10% of the papers examined some conversational agent, robot, or other form of interactive technology as a replacement for a human role, such as

a friend, teacher, or romantic partner (See subsection 4.4.3). We raise two questions for HCI scholarship. First, do we need a new theory of social support for HCI community? The theories most often cited in HCI originate in psychology, medicine, and related fields, where social support is conceptualized as an interpersonal phenomenon. For example, the definition most frequently cited in HCI describes social support as *"an exchange of resources between at least two individuals perceived by the provider or the recipient to be intended to enhance the well-being of the recipient"* (p.13) [154]. Thus, if one of these individuals is a non-human entity, does it still count as social support? Recent research has considered technologies such as video game characters to provide emotional and instrumental support, so that players can satisfy emotional needs while being protected from risks in real life, such as betrayal [94]. These developments challenge existing theories and prompt us to ask whether HCI requires new conceptualizations of social support that better reflect technology-mediated contexts and user needs.

Second, what are the unintended consequences and ethical considerations introduced by shifts in relational dynamics when our aim is to design technologies that simulate or replace human interactions? Technology such as romance simulation games can shape the idealized beliefs that players may have about relationships, where the increased expectations formed in the parasocial relationship in virtual settings can inadvertently create barriers to offline social engagement [157, 190]. The authenticity of empathy conveyed through conversational agents is another key ethical concern. While AI systems can simulate supportive behaviors, they lack genuine human emotions. AI chatbots may foster extreme emotional attachments (for example, grief over the sudden disappearance or alteration of an AI companion) and dysfunctional emotional dependence (for example, continued engagement despite recognized negative effects on mental health) [171]. Such attachments mirror unhealthy human relationships and can lead to anxiety, obsessive thoughts, and a fear of abandonment [78, 171]. In conclusion, we encourage future research to thoroughly consider how the term social support should be conceptualized in HCI scholarship and to account for the potential harms of non-human support.

5.4 Expanding the Scope of Social Support Research

Across the literature we reviewed, we found that there has been significant attention given to studying social media and online communities, focusing on health-related contexts, employing survey and interview methodologies, and operationalizing social support as peer support among strangers. In this section, we draw attention to some areas that have been understudied, highlighting opportunities for future research to fill these gaps to extend our knowledge on how technologies can facilitate social support. Most studies examined social media and online communities, which was expected as these platforms are not only prominent in social life, but also provide large and readily available datasets that enable researchers to study behavior and inform technology design [5, 122]. There was less focus on established and emerging technologies within ubiquitous computing, video games, and crowdfunding (refer to Table 3). Future studies could consider broadening the range of technologies examined to better understand their various potential

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to facilitate social support among users. Additionally, the majority of studies were situated in health-related contexts. Other important domains, such as learning, parenting, and the workplace, remain underexplored (refer to Table 5). Different contexts may surface different forms of social support, and findings from one context will not always be relevant or transferable to another. For example, a study on workflow framed social support as task management and progress monitoring [140], whereas a health-focused study emphasized sharing advice and empathic encouragement [2]. Future work could therefore diversify the contexts, populations, and activities studied to broaden insights into how technologies facilitate social support. Furthermore, we found that most studies involved survey and interview methodology, with a few other methods such as participatory design, field deployments, or experiments (refer to subsection 4.3.2). Future studies could consider how other methodologies may expand our understanding of technology-facilitated social support, for example, through design research or observing real-world use.

Among the papers we examined, social support was most often operationalized as peer support among strangers, reflecting an emphasis on community-driven interactions (refer to Table 6). Peer support among strangers can generate valuable impacts such as exchanging advice, receiving emotional encouragement, and fostering a sense of community. For example, people living with shared conditions turn to online communities or social media to share experiences, fostering a sense of belonging among previously unconnected individuals, such as those with cancer, stay-at-home fathers, or women with vulvodynia [8, 185, 187]. However, existing social bonds might introduce different forms of social support. For example, one paper in our sample proposed smart water bottles to encourage drinking more water through accountability of another person with whom the user has an intimate relationship [42]. In this context, social support among a close relationship is used for influencing and facilitating users' desired behaviors (i.e., increasing the hydration status). Another work on a healthy snacking mobile application found that the social dynamics of how families engaged with each other and with the app increased awareness of both individual and family snacking practices [148]. The relational depth might bring some different perspectives, such as instrumental support. Therefore, future studies could consider moving beyond designing for individual and peer-focused to study how technologies can support collective well-being in close relationships such as families and romantic relationships.

6 Conclusion

Through our systematic review of 183 articles, we examined how HCI research has conceptualized, operationalized, and designed for social support. We found that this literature has particularly relied on categories and typologies, and focused on certain areas, such as health-related, social media, and peer support among strangers. Building on our findings, we encourage future studies to move beyond currently investigated topics, methodological approaches, and well-researched domains of social support. Our review highlights that the multidimensional nature of social support is often undermined, and some focus on social support provided by technologies

rather than humans compels investigations into unintended consequences and ethical considerations. We recommend that future work clearly contextualize and define social support to ensure that HCI scholarship creates consistent and well-grounded conceptualizations for effective design, evaluation, and implementation of related technologies.

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