Secondary Publication



Cobb, Robert Dominic; Gross, Tom

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Date of secondary publication: 30.10.2026

Version of Record (Published Version), Conferenceobject

Persistent identifier: urn:nbn:de:bvb:473-irb-117800x

Primary publication

Cobb, Robert Dominic; Gross, Tom (2026): Towards a Better Understanding of Connectedness: An Exploratory Study of Items on the Work Desk, in: ECCE 2026 - Proceedings of the European Conference on Cognitive Ergonomics, N.Y.: ACM, pp. 367–370, doi: 10.1145/3822301.3822302

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Towards a Better Understanding of Connectedness: An Exploratory Study of Items on the Work Desk

Robert Dominic Cobb
Human-Computer Interaction Group
University of Bamberg
Bamberg, Germany
robert-dominic.cobb@uni-bamberg.de

Tom Gross*
Human-Computer Interaction Group
University Bamberg
Bamberg, Germany
email@tomgross.net

Abstract

Connectedness is the experience of feeling connected with other persons over distance. Many items on users' work desks facilitate this experience. However, very few studies have analysed which and how items contribute to Connectedness in situ, leading to a limited understanding of users' needs. We present an exploratory mixed-methods study to address this gap. We analyse 1,212 items from the desks of 43 participants to discover commonalities of such items and to distil items facilitating Connectedness. We analysed the relationship between reported levels of Connectedness with the presence of items associated with other persons as well as with the presence of certain types of items. We identified several patterns among these items, such as that they are often inconspicuous. Additionally, they are often received as gifts or otherwise associated with shared memories.

CCS Concepts

• **Human-centered computing** → Collaborative and social computing; Empirical studies in collaborative and social computing.

Keywords

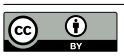
Connectedness, Empirical Study, Implications for Design

ACM Reference Format:
Robert Dominic Cobb and Tom Gross. 2026. Towards a Better Understanding of Connectedness: An Exploratory Study of Items on the Work Desk. In *European Conference on Cognitive Ergonomics (ECCE 2026), September 15–18, 2026, Siena, Italy*. ACM, New York, NY, USA, 4 pages. https://doi.org/10.1145/3822301.3822302

1 Introduction

Many persons spend significant time working at desks, either at an office or increasingly at home. It is therefore unsurprising they also wish to personalise their desks [16]. Some persons may display items on their desks that remind them of others. For instance, many persons cherish items they associate with their family, such as drawings from their children [4]. Such items can be described as facilitating Connectedness.

*Corresponding author.



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ECCE 2026, Siena, Italy
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ACM ISBN 979-8-4007-2515-9/2026/09
https://doi.org/10.1145/3822301.3822302

Connectedness is "the feeling of being in touch with the other" [9, p. 927]. This feeling may help to alleviate loneliness. Loneliness is a significant problem worldwide [14]. Persons affected by physical health conditions may also benefit from Connectedness [3]. Furthermore, Connectedness is also highly relevant at work (e.g., for feeling connected to one's romantic partner while geographically separated).

However, research investigating the items which facilitate Connectedness at work is scarce. Due to the subtle nature, designing for Connectedness is a challenge [6; 7]. Researchers and designers would greatly benefit from a study analysing the items persons choose to surround themselves with for experiencing Connectedness. This motivates us to address the research questions of which items on persons' desks facilitate Connectedness in situ as well as which implications for the design of such items can be derived. We conduct an exploratory mixed-methods study, analysing 1,212 items from the desks of 43 participants, in photographs taken by the participants. We assess the relationship between reported levels of Connectedness with the presence of items associated with others as well as with the presence of certain types of items. We derive design implications based on our findings.

2 Related Work

Previous work has looked into the items persons surround themselves with, in the workplace or otherwise. For instance, Csikszentmihalyi and Rochberg-Halton [4] investigated items cherished by persons as well as the relationship between persons and their items. They conducted interviews and categorised the items. Regarding items at the workplace, Wells [16] conducted a study to investigate the relationship between employee well-being and office personalisation. Their study consisted of both a survey and interviews with a subset of the participants, of which the workspaces were analysed. While the study was not primarily concerned with Connectedness, they found that "most people (68%) display symbols of personal relationships" [16, p. 246]. Lastly, Brandes and Erlhoff [2] published a book concerned with persons' desks, which originated from a student project. They analysed photographs of desks, taken by students in eleven countries. However, this was not a systematic study and not intended to investigate Connectedness.

Some ethnographic studies related to Connectedness have been conducted. For instance, Vetere *et al.* [15] investigated the technology used by close persons to mediate their relationship. They employed cultural probes and conducted interviews as well as focus groups. Ethnographic approaches are also commonly used to study work-related contexts. Blomberg and Karasti [1] provided a

comprehensive overview of work concerned with ethnography in Computer-Supported Cooperative Work.

However, to the best of our knowledge, no studies have systematically analysed the items commonly found on desks and related those items to Connectedness.

3 Method

In this section, we describe our participants, procedure and measures.

3.1 Participants

A total of 55 participants were recruited from the personal environment of students. They did not receive financial incentives. We gathered demographic data with standardised questions based on Hoffmeyer-Zlotnik and Warner [8]. Participants were excluded from the analysis if they rated their English reading or writing proficiency as "poor" [5], did not have their own individual desk [2], could not decorate or modify their desk to reflect their identity [16], did not use their desk habitually, i.e., had not been working at their desk for more than 66 days [11], or took all photographs in such a way that a substantial part of the desk was out of frame, preventing a repeatable analysis (based on our preliminary studies). Twelve participants were excluded from further analysis: Two participants (3.6%) due to lack of English reading or writing proficiency, four participants (7.3%) who did not have their own individual desk, two participants (3.6%) who could not decorate or modify their desk, and four participants (7.3%) who had not been working at their desk for more than 66 days.

Our final sample consisted of 43 participants who were between 19 and 55 years old ($M = 28.16$, $SD = 9.695$). 23 were male (53.5%), 19 female (44.2%), and one non-binary (2.3%). Five participants (11.6%) were married or in a registered partnership and living with their partner. One participant (2.3%) was married or in a registered partnership but not living with their partner. 37 participants (86%) were never married and never in a registered partnership. Of those 37 participants, eleven participants (29.7%) were living in a consensual union with a partner in the same household, and 26 participants (70.3%) were not. 13 participants (30.2%) were employed full-time with 40 weekly working hours; four (9.3%) were employed part-time with 20–39 weekly working hours; and 15 (34.9%) had less than 20 weekly working hours. Nine participants (20.9%) were not employed. Two participants (4.7%) did not disclose their employment status.

3.2 Procedure and Measures

Before the start of the study, participants gave informed consent. Participants then completed a demographic questionnaire, and the main questionnaire. Both questionnaires were implemented with custom web-based forms. Participants used their own devices. The main questionnaire asked participants to photograph their desks from two perspectives: from a bird's-eye perspective and from a 90-degree angle [2]. Participants were instructed not to curate items and not to rearrange anything on the desk. If some items were not visible from either perspective, participants were instructed to submit a third photograph, clearly showing all hidden items. After submitting the photographs, the participants answered close-ended questions, followed by open-ended questions.

Two reviewers independently identified and counted the items by marking them in the participants' photographs. To assess inter-rater reliability of the item count, ICC estimates and their 95% confidence intervals were calculated using SPSS Statistics 29 based on a mean-rating ($k = 2$), consistency-agreement, 2-way mixed-effects model [10]. Inter-rater reliability was excellent [10], *ICC* = .979, CI [.961, .989]. The reviewers subsequently resolved all disagreements and reached a 100% consensus.

The two reviewers then independently categorised those items based on the categories of Wells [16]. They independently analysed the answers to the open-ended questions and matched them to the respective photographs. The categories included whether the items were associated with personal relationships with others (family, friends, romantic partners, pets, others) as well as the types of items (art, music or theatre, values, sports, entertainment, souvenirs, achievements, work-related, cartoons, plants, other) [16]. Beforehand, the reviewers agreed upon definitions. The categories were nonexclusive. The agreement between the reviewers was 96.7% for items associated with others, and 81.2% for item type. Because the categories regarding items associated with others were independent, i.e., there was no requirement to assign a category from this set if the item was not associated with personal relationships, Cohen's measure of agreement was calculated to assess inter-rater reliability. The agreement was moderate to perfect [12] for these categories, $\kappa_{\text{family}} = .711$, $\kappa_{\text{friends}} = .591$, $\kappa_{\text{romantic partners}} = .893$, $\kappa_{\text{pets}} = 1$, $\kappa_{\text{others}} = .497$. The reviewers subsequently resolved all disagreements and reached a 100% consensus.

We also collected the location of the desk (at home, at an office, elsewhere). We asked the participants to rate to what extent the items made them feel close, able to connect with, and actively involved in the lives of people who are geographically separated from them (rated on six-point Likert scales ranging from "strongly disagree" to "strongly agree") [13]. Lastly, we asked the participants the open-ended questions of Wells [16]: why they display these items, what these items mean to them, how important these items are to them, and whether they ever change the items they have displayed [16].

4 Results

The results include the desks in general, the count of desks by items associated with others, the count of desks by types of items, and the correlations between Connectedness and the count of items for both sets of categories.

4.1 Desks in General

Each participant had one desk, therefore there were 43 desks in total. The desks were primarily used for work or study. Some participants also described additional activities, such as "playing games" on their computer, "chat[ting] with friends," or using it "also [as] a storage place." 37 desks (86%) were located at home, and six desks (14%) were located at an office. In total, the desks had 1,212 items. The desks each had between four and 79 items ($M = 28.19$, $SD = 18.447$).

Table 1: Spearman rank-order correlations between the reported levels of feeling close, able to connect, and actively involved in the lives of geographically separated persons through the items and the count of items on the desk, which were associated with others.

	Family	Friends	Romantic Partners	Pets
Close	.281	.314*	.123	.122
Able to Connect	.097	.215	.033	.135
Actively Involved	.314*	.167	.043	.084

* $p < .05$

Table 2: Spearman rank-order correlations between the reported levels of feeling close, able to connect, and actively involved in the lives of geographically separated persons through the items and the count of types of items on the desk.

	Work-related	Entertainment	Art	Souvenirs	Plants	Music/Theatre	Values	Sports	Cartoons
Close	-.063	-.176	-.090	.167	.156	.147	-.183	.186	.133
Able to Connect	-.111	-.046	-.271	.009	.256	-.065	-.421**	.060	-.047
Actively Involved	-.255	-.214	-.065	-.162	.155	.057	-.159	-.181	-.050

** $p < .01$

4.2 Count of Desks by Items Associated with Others

In total, 23 desks (53.5%) had items associated with personal relationships with others. Eleven desks (25.6%) had items associated with family. Nine desks (20.9%) had items associated with friends. Five desks (11.6%) had items associated with romantic partners. One desk (2.3%) had an item associated with pets. Lastly, seven desks (16.3%) had items associated with other persons, not relevant to our analysis.

4.3 Count of Desks by Item Type

All 43 desks (100%) had work-related items. 22 desks (51.2%) had entertainment items. Nine desks (20.9%) had art. Likewise, nine desks (20.9%) had souvenirs. Six desks (14%) had plants. Five desks (11.6%) had music or theatre items. Likewise, five desks (11.6%) had items associated with personal values. Four desks (9.3%) had sports items. Likewise, four desks (9.3%) had cartoons. No desks (0%) had items associated with achievements. Lastly, 42 desks (97.7%) had other miscellaneous items, not relevant to our analysis.

4.4 Connectedness

Spearman rank-order correlations were calculated to assess the relationship between reported levels of Connectedness through the items and the count of items on the desk associated with others (cf. Table 1). There was a significant positive correlation between feeling close to others and the count of items associated with friends, $r_s(41) = .314$, $p < .05$. Additionally, there was a similar significant positive correlation between feeling actively involved in the lives of others and the count of items associated with family, $r_s(41) = .314$, $p < .05$.

Spearman rank-order correlations were calculated to assess the relationship between reported levels of Connectedness through the items and the count of types of items on the desk (cf. Table 2). There was a significant negative correlation between feeling able to connect with others and the count of items associated with personal values, $r_s(41) = -.421$, $p < .01$.

5 Discussion and Conclusion

Desks with items associated with personal relationships with others were common, as 53.5% of desks had such items. For instance, one participant had a Lego minifigure, a Positive Potato (a crochet plushie holding a sign with a positive or humorous message), and Pokémon cards, which reminded them "of my time with my friends and how supported I am." This finding is supported by literature. Csikszentmihalyi and Rochberg-Halton [4] found that their participants cherished items associated with persons, such as family or friends. Additionally, Wells [16] identified that most participants had items associated with other persons in their study. This suggests that Connectedness is important to many desk users.

The items which appeared to facilitate Connectedness often did not show their association with other persons outwardly. For instance, one participant had a game controller, which they described as having "personal worth to me because it was […] a gift, but it sadly doesn't work anymore." This is supported by our quantitative findings, in which no type of item had a particularly strong association with Connectedness (cf. Table 2). Items designed to facilitate Connectedness should therefore be inconspicuous and provide privacy.

Our data suggest a trade-off between items associated with other persons versus personal values—based on two related findings. Firstly, Participants who displayed items associated with personal values stated that their items made them significantly less able to

connect with other persons (cf. Table 2). Secondly, these participants also displayed fewer items associated with other persons, as feelings of Connectedness were typically stronger when items associated with others were present (cf. Table 1). Instead, they stated that their items "help me with self-fulfilment" or "serve as a little motivation for me." Their needs should not be overlooked by designing items, which remind them of their values.

Some desks were utilitarian, i.e., they mostly presented work-related items. These desk users may desire to minimise distractions. One participant explained that "I don't display any other items than necessary on my desk to reduce distractions while working." They may even have work-related items, which facilitate Connectedness, such a monitor stand "my boyfriend gave me." These needs should be addressed, for instance, by designing items that offer utility beyond Connectedness, i.e., multi-purpose items.

Some desks were minimal, i.e., they presented few items overall. These items were often carefully selected. For instance, one participant who stated that they "like to keep a minimalistic desk setup" had a water bottle, which "reminds me of my girlfriend" as well as a cup of tea, which "reminds me of my father." To address the needs of desk users who only display items selected with care and intention, items for Connectedness should be special to the users.

Gifts were especially prevalent and often associated with specific persons. Many participants described items, which were received as gifts, such as a lucky charm ("gift from my mum") or an anime figure ("a gift from friends"). Some items were associated with other persons because they reminded participants of shared experiences. For instance, one participant stated that a bracelet bought during a trip to Japan "with some good friends" reminded them "of good times." Items for Connectedness should therefore be designed to be given as gifts or otherwise linked to shared memories.

In conclusion, item type was not a strong indicator of Connectedness. Instead, items which facilitated Connectedness had in common that they were often associated with shared memories or received as gifts. They often did not show the association with other persons outwardly. Additionally, we discovered that some desk users prefer to be connected to and reminded of their personal values rather than being connected to and reminded of other persons.

Our study is not without limitations. Firstly, we based our categories on the established categories by Wells [16]. This may have limited our results as most participants in our study had other miscellaneous types of items on their desks. We did not assess the relationship between these items and Connectedness. Therefore, our results may not generalise to all types of items. However, the quantitative results were corroborated by the qualitative evidence which further suggested that item type was not a strong indicator of Connectedness. Secondly, few desks had items for some categories, such as pets. A larger and broader sample may be needed to investigate these areas further.

While our study focused on a work-related context, future work could look into the items persons surround themselves with in other areas of life. Additionally, our findings have practical implications for future designs. Researchers of items intended to facilitate Connectedness may benefit from the design implications and user needs we identified in our study.

Acknowledgments

We thank the members of the Cooperative Media Lab of the University Bamberg. We also thank the reviewers for their valuable comments.

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