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Systemic-Relational Design to Enhance Empathy Processes

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Abstract. The chapter investigates the role that design discipline can have in the field of human affective relationships. For this role to be effective, the designer will have to elaborate strategies, tools, and methods for the development of a new generation of relational and interactive artefacts that, through innovative analogue and digital solutions, are proposed as active mediators of interpersonal emotional relationships. Mediation can take place through the decoding of signals with a high emotional component and the management of multisensory interaction modes.
The paper proposes some projects developed in this direction within the Hybrid Design Lab, a laboratory born in the Department of Architecture and Industrial Design of the University of Campania "Luigi Vanvitelli", from 2022 placed in the Department of Architecture of the University of Naples Federico II.

Introduction

The chapter explores the possibility that design, collaborating with other disciplines, may be able to conceive artefacts useful for improving the quality of affective relationships between people. This investigation intends to offer a contribution to the design culture by identifying a new design scenario that can be defined as systemic-relational design because it refers to systemic-relational psychotherapy approach originated in the United States around the 1950s. The protagonists in the elaboration of this theoretical and clinical model are the founders of the Palo Alto School and the Mental Research Institute: Gregory Bateson, Don D. Jackson, Jay Haley, and Paul Watzlawick. Systemic-relational psychotherapy is based on the observation of the interaction between the patient and his family in order to reinterpret and modify dysfunctional behaviour, highlight and exploit the resources of the individual and the system, with the aim of re-signifying symptoms and explicating their function within the relational nucleus. We work on the situations and relational dynamics that may have led to the symptomatic onset rather than on the symptom itself.

In design field this approach can foster alternative ways of emotional interaction to counter the conditions of isolation, loneliness, and depression that are increasingly widespread due to the perennial state of fragility induced by the looming environmental, health, and economic emergencies and alienation caused by the pervasiveness of digital technologies in everyone's daily life [1].
Various researchers in sociology, anthropology, and psychology describe the afflictive state of individuals who suffer a feeling of loneliness despite the spread of social networks and telecommunication technologies.

From a social welfare perspective, telecommunication tools can be interpreted as bridges that connect people by bridging distances of time and space. Social neuroscientists define multimodal human relationships to denote the combination of interactions that extend from the physical world into the online dimension, or from the web also propagate into the physical world. This offers opportunities for shyer and less active people to overcome their resistance [2].

But the concept of loneliness in the age of hyper connectedness takes on different and complex nuances [3, 4]. In digital relationships, the senses are generally not stimulated to the same extent as in face-to-face relationships. In phone calls and voice messages, only hearing is possible, in video calls only sight and hearing. The reduction in sensory complexity leads to an impoverishment of cognitive and emotional potential and induces people to be more rational, and to measure and control

their actions and reactions. Digital communication no longer requires people to make the effort to manage and modulate the multiple sensory and emotional dimensions that come into play in face-to-face interactions, not mediated by technological devices. Even the mechanism of recalling previous experiences, which is based on sensory stimuli, is reduced to the detriment of the emotional intensity of the experience. Thus, all the variables related to the perception of the impact of the other on personal space, the emotional effect of eye contact, the communicativeness of expressive facial nuances, and body language are lost [5].

The prevalence of these forms of communication in the lives of individuals, particularly young people, results in an emotional detachment with a prevalence of functionalist rationality, especially when communication is asynchronous and not having to respond instantaneously allows for more rational reflection and planning of responses to stimuli. The coldness and detachment of these modes correspond to a greater superficiality. Contacts may multiply, but the sense of intimacy tends to become artificial and fleeting, and the sense of loneliness is amplified [6].

Interaction as biological matter

Some researchers have shown that people with close interpersonal relationships of friendship or love use video calls and chats to preserve this bond, but, in fact, these tools rarely foster relationship growth. Physical distance leads to a lack of physiological relationships between people's bodily components. All physical manifestations of affection such as hugging, caressing, and meeting of the eyes have an effect on people's physiology as they stimulate the production of substances that affect mood and psycho-physical well-being such as [7].

The human body is both an emitter and receptor of information and stimuli, but it is also an instrument for determining space, objects, and the shape of human relationships. An important role in interpersonal relationships is played by mirror neurons that enable empathy with other people and the environment, colors, and sounds that determine the development of cognitive and emotional experience. Emotions arise from the combination of the contingent condition and the set of experiences, knowledge, and memories that the individual has accumulated over previous time.

The result is a contraction of the flow of interchange and reciprocity. The interaction between bodies as living biological matter and between bodies and space is reduced, and that dimension of chain reactions that set in motion and nurture the vital process of human relationship is missing. The digital relationship, at least as it has been experienced so far, however complex and changeable it may be, requires bodies to assume predefined, customary and codified positions and configurations. The human relationship in presence involves all the senses and the extensions of the body determines a continuous adaptive transformation of experience, of the substance of space and things. The whole experiential compartment is more indefinite and less predetermined with a continuous questioning of patterns through the human's capacity to feel and transmit [8].

It seems that hyper-connectedness and over-exposure, therefore, aggravate conditions of depression and inadequacy [9]. In particular, in affective, family, friendship or love relationships, the solder constituted by physiological intimacy is increasingly weakening,

These major differences between digital and analogue experiences in presence should not lead us to demonize the digital, which is an integral and inevitable part of the Anthropocene. Rather, it can serve to design digital experiences more consciously, in order to make them a means of transformation, of breaking the mold, of interpenetration between technological matter and corporeal matter.

Designing antidotes to loneliness

For designers, it is imperative to rethink objects, environments, and the human body itself with the tools and filters induced by contemporaneity, the pervasiveness of the digital, emergencies, and the growing fragility that comes with it.

Before the COVID-19 emergence, digital technologies were largely understood as an extension of the body today it is the body that appears almost as an extension of technologies, as a transdigital

platform in close continuity, as well as contiguity, with the multiple manifestations of the digital dimension [10].

On the other hand, the body today is a platform connected to the digital but much more unknown with respect to technology because contemporary medical and biological sciences do not yet fully understand the logic that correlates the physiological component of interpersonal relations, linked to endocrine or neurological phenomena, with the psychological one.

The methodological approach followed in this chapter is based on a theoretical investigation into the impact of design on emotions and relationships between people, followed by a description of the state of the art of relational design and then the illustration of projects developed in the Hybrid Design Lab. These examples serve to demonstrate how important it is in this field to use a hybrid multidisciplinary approach that also involves sociologists, psychologists, and neurologists. In the described projects, the concept of interpersonal relations is expressed both in its "in presence" meaning, within predominantly private and domestic spaces, and "at a distance" meaning, with particular attention to the new needs that have emerged following the Sars-Cov-2 emergency. The intention is to respond to these new needs by grafting new forms and modes of empathy-driven experience through the use of wearable technologies and furnishing products.

The conceived artifacts are proposed as agents that induce people, their behavior, and thoughts towards directions and approaches that facilitate communication, empathy, mutual understanding and processes of cohesion and collaboration.

In those that include the digital component, relational mediation is conducted by means of sensor and processor systems that implement machine learning algorithms and signal actuation systems, both digital and analogue, embedded in networked products in an Internet Of Things perspective that connects the digital dimension with the physical-analogue one.

Design as a tool for relational mediation

Design that deals with configuring artifacts that mediate relationships between individuals must increasingly relate to disciplines such as neuroscience, cognitive and behavioral psychology, form psychology and sociology. It therefore lies in a hybrid direction between medical science and the humanities, as is often the case with design. Designers therefore have the task of acquiring hybrid extra disciplinary knowledge, such as that concerning the functioning of mirror neurons and empathy.

To assess the ability of objects to influence interactions between people, it is important to first analyse the studies conducted on the ability of objects to stimulate emotions. The relationships existing between the nervous system, sensory stimuli, perception, and memory constitute an important foundation for the design of objects that should orient, moderate, and modulate relationships between people.

Analyzing the relevant scientific literature, it emerges that from the 1970s onwards, questions related to the ability of objects to generate conditions conducive to social interaction or to hinder it had become relevant.

The sociologist Ivan Illich in Tools for Conviviality emphasized the ability of objects to generate conditions conducive to social interaction or to hinder it but questioned whether the industrial production system could fully meet the needs related to conviviality by making people passive consumers who are unable to manage individual freedom related to personal interdependence. By conviviality Illich means the set of creative and autonomous relationships that exist between people and between people and their environment. For Illich, conviviality is in contrast to the modes of interaction imposed by artificial products, which as predefined leave no room for creativity and autonomy [11].

Lucius Burckhardt later observed in the 1980s, however, that all types of objects, even industrial ones, cannot be considered neutral, because through them the intentions of the designers, the companies that produce them, and the users that condition relationships and behavior are manifested. The design of products, and services related to them, consciously takes into account the invisible overall system composed of objects and interpersonal relationships [12].

A leading role in this perspective was played by Donald Arthur Norman, professor of Cognitive Science and Psychology at Northwestern University, who in his text Emotional Design states that an object's ability to arouse positive emotions makes it more desirable than one designed simply with ergonomic or exclusively functional criteria [13].

At the intersection of neuroscience and design lies neurodesign, a branch of neuroaesthetics that studies neuronal reactions in response to stimulus provoked by objects, products, environments and services [14]. It has been shown that when a product or object stimulates the orbitofrontal areas of the brain, which are the centers of the perception of beauty and pleasure, it receives a series of stimuli by transforming them into an electrochemical language. This type of analysis is called sensory analysis, that is a process of evaluation using the senses that began to be theorized in the middle of the last century. The nerve structures that receive sensory stimuli have the function of organizing and interpreting them, and then sending the processed information to the brain. Perceptual structures then process the sensory information and enable the brain to recognise surfaces, shapes and objects. These capabilities are greatly influenced by previous experiences and are therefore closely linked to memory, which enables the individual to make complex evaluations called synesthesia. These complex evaluations can involve, for example, colors, awakening unconscious memories and can be exploited to design spaces that aim to create environmental comfort [15].

Empathic design is a human-centered approach that pays attention to people's emotions and needs. The basis of empathic design is observation, with the aim of identifying unexpressed latent needs and creating a product that the user did not know they wanted, in a way that is antithetical to traditional marketing research. The observations are carried out by teams of designers, sociologists and engineers. Designers come into empathetic contact with people, who became a source of inspiration and innovation.

The method defined by Leonard and Rayport [16] is based on the following steps:

- observing and understanding the market and people;
- observing people in real-life situations to understand what makes them;

weak, what confuses them, what they love or hate, where they have latent needs unmet by existing products or services;

- reflection, brainstorming, visualizing innovative concepts;
- developing and marketing innovative products.

Empathic modeling is a strategy of Empathic Design that helps to broaden one's empathic horizon: experiencing the psycho-physical situations of others to understand their point of view, develop a deeper understanding, acquire greater empathy and emotional connection to others, promote a change in personal thinking and help the designer detect what is important.

The birth of Relational Design occurs with the shift from the 'science of the object' to the 'science of relationships' as the product is no longer seen as an entity in itself but in relation to people and the context in which it is placed. Relational ties are embodied in relational objects: relational design products participate in the systemic and social dynamics that develop within a stable or temporary social group, creating a focal point of attention to encourage communication, interaction, and mutual sharing. Relational objects fit into the dynamics facilitating communicative exchange, they are boundary objects that can be mediating, organizational, participatory, and narrative. This is a concept introduced by Star and Griesemer in 1989 [17], to define any object that, as a marginal presence, exists at the intersection of two or more different social worlds, facilitating communication between them, without fully belonging to any of them, and acquiring a different identity in each social world it inhabits.

While the scientific literature is quite extensive on the relationship between objects and induced emotions, there are fewer treatises on the impact of artifacts in mediating human relationships. Most of these studies concern the action of digital technologies on interaction since the 1980s when the electronic revolution took place. During this period it was proposed that objects acquired an electronic soul or a smart technological component, opening up the horizon of interaction design, in which artefacts that were inert and opaque in the past, acquired the capacity to perceive and react, interacting with people and mediating interactions between individuals , and between people and environments.

A horizon that, with the development of digital technologies and infrastructures over the last two decades, in the dimension of the Internet Of Things [18], has led objects to be equipped with sensors, actuators, and connective devices that enable them to acquire messages, data, and information from users, transferring them to the network and to other individuals, outlining a complex relational infrastructure rich in potential. Extending Illich's vision, the IOT generates a new parallel digital and global conviviality.

Wearable systems are the epitome of the Internet of things, which is now mature enough to represent an extremely important global market. E-watches are an emblematic example of the state of the art of wearable systems, the tip of the iceberg of the now mature wearable technology, of which bracelets, patches, fitness bands, are other applications. A feature of these systems is often synchronization with smartphones, through which everyone can create a personal cloud computing for wearable devices, the Wpan (Wireless personal area network), which brings together handheld devices with wearables to interconnect and control our surroundings in an immediate and personalized manner.

The IOT makes it possible to 'animate' lamps, household appliances, and music devices, creating a scenario in which living environments are a place of interaction not only between people but also between people and machines.

In the text Hacking Life: Systematised Living and Its Discontents, Joseph Reagle dedicates space to the topic of Hacking Relationships, emphasizing how the intermediation of digital tools and the processing of quantitative and qualitative data used to manipulate certain aspects of interpersonal relationships cannot govern, let alone predict relational dynamics, the nuances and unpredictability of which are so complex that no programming and calculation tool could manage them [19].

The new frontiers of IT product development aim to implement sentimental products that take into account the user's reaction to the system and interact with it based on their emotional state. The realisation that emotions are a fundamental component of behavior and communication, has led developers of human-computer interaction systems to take the emotional aspect into account in the human-computer interface.

Affective computing is an innovative methodology for the development of systems capable of recognising, interpreting and emulating human emotional behavior, in which artificial intelligence, soft computing, psychology, neurocognitive sciences and sensory technology are combined. Affective computing is a new branch of computer science that was born in 1995 with a book by Rosalind Picard [20], researcher at the Massachusetts Institute of Technology in Boston. Her emerging idea is that the machine can interpret the human emotional state and adapt its behavior.

In recent years, sensory technology in combination with embedded computing has created an ideal application platform for the realization of systems with emotional interpretation and interaction capabilities.

Wearable computing is the enabling technology that brings affective computing to integration with the user's body. Thanks to single-chip system integration technology, a new generation of wearable systems or systems that can be integrated with the human body and its natural activities has already been achieved. By integrating sensors and actuators, wearable devices allow affective computing models to be implemented so that they can interact non-invasively with the person and their environment.

Affective sensors are a new generation of sensors (interaction technologies with the world/with individuals) that capture physical, physiological, or bioelectric information and extract emotional and behavioral information. The detection of emotions can take place through:

- voice, one of the signals with the highest information content of an emotional nature, a non-invasive and non-collaborative;
- facial expression, for video capture;
- gestures, for video capture;
- galvanic conductivity of the skin;
- heart rate, for capture at the periphery of the body, from the hands (for support), from the wrist (strap, bracelet, watch, etc.) as an electrical signal, or from the chest with a patch;

- skin temperature.

A further development in sensory technology that further extends the applicability of affective computing on mobile platforms is contextual sensing [21]: an integrated sensory technology that utilizes sensors of various natures (static, movement, height, environmental temperature) and algorithms that fuse information with respect to where the user is.

Thanks to this sensory approach, affective computing applications can be supported by microelectronic solutions suitable for the realization of wearable applications.

Here, design has the ability to build bridges between the technical-scientific rigor of computer science and neuroscience, with the more human components of relationships such as psychological, cultural, and emotional aspects.

Wearable relational products can make it possible to orient and modulate relationships but also to map them by acquiring physiological and biometric data connected with emotions and perceptions in order to obtain relational and emotional maps. These maps, which are then traced back to the cognitive and communicative aspects, can be the input for sociological studies, business organisation processes, and marketing activities.

These data can be acquired and decoded with the expressive languages and tools of design, such as storytelling, in order to increase the interpersonal awareness of users.

Digital contiguities and the multi sensoriality of emotion

Among the design experiences analyzed in the course of the research in the international sphere, particular attention was paid to two categories of projects those that attempt to recapitulate the multimodal complexity of relational experience through multisensory technological artefacts based on virtual and augmented relationships, and those that, instead, through the intermediation of predominantly analogue objects, aim to 'orient' relationships, almost forcing them in a direction of reciprocity and attentiveness.

To the first group of projects belongs predominantly digital products, often wearable, in which the integration of sensors and actuators enables connection between distant people, establishing new forms of proximity in which emotions and sensations, rather than messages, can be shared. For instance, Pillow Talk, developed by London-based start-up Little Riot, aims to restore intimacy in long-distance relationships by remotely transmitting a person's heartbeat to their loved one and vice versa. The product-service system consists of two kits consisting of a sensor bracelet (sender) and a small speaker (receiver). The wristband must be worn by both before going to sleep, while the speaker must be placed under the pillow to allow contact when in bed. The elements are connected to each other via the Little Riot app that must be installed on the smartphones of both users. The project is based on the assumption that being able to listen to the sound of a distant loved one's heartbeat helps to maintain empathy.

The Bond bracelet, developed by the also London-based start-up Kwamecorp, relies on tactile rather than auditory sensory perception. When one person touches or caresses the bracelet, the other feels a slight vibration, intended to emulate a caress, and sees an LED light up whose colour correlates with the duration of the caress. The components integrated into the Bond are a touch sensor, a vibration motor, an LED, a battery, an accelerometer, access for charging, and Bluetooth with which it connects to an app that must be downloaded to a smartphone. The related app records the strokes, their frequency,duration, and translates them visually as a kind of 'emotion map'. The Hey bracelet developed by House of Haptics sends haptic signals to transmit haptic stimuli with different intensities depending on the intended message.

Researchers at City University of London's Imagineering lab in 2016 responded to the problem of long-distance relationships with the design of a device evocatively named Kissinger that allows for remote kissing using pressure sensors and mechanical actuators. The two long-distance partners insert their smartphones into the device, then initiate a video call, via the dedicated app, during which they can each kiss the surface of the Kissinger, which contains sensors that detect the pressure points of the lips and translate them into data that are sent to the recipient's device on the phone, which processes them by translating them through mechanical actuators into a dynamic morphology that

reproduces the lips in the act of the kiss being sent. The aim is to offer partners the sensation of a live kiss.

The company CuteCircuit has developed HugShirt, a t-shirt that allows people to virtually embrace those who are far away, thanks to a smart fabric that incorporates sensors that record the mechanical and thermal stresses related to the act of hugging by transferring them via Bluetooth.

The objects of the new conviviality

To the second category of projects belongs furniture and home accessories for a new conviviality. This type of furniture often presents unusual aesthetic characteristics to attract attention, destabilize, make one reflect, with the intention of breaking through the wall of inattention that characterizes the frenetic and hyperchaotic daily life of so many individuals. In particular, these furnishings focus on the material, analogical component, on multi-sensory physical perception to counteract the detachment from the concrete world induced by connective and collective hyper-digitalisation.

Outdoor furnishings often have a more conceptual character because they address a message to society, such as the installations by Michael Beitz, an American artist and designer, who plays with the functionality of everyday furnishings, such as the picnic table, the sofa, the bench, and many others, reinterpreting them through distorted and twisted morphologies that evoke the feelings of isolation and alienation that are increasingly felt in relationships between people. Knotted sofas, intertwined beds, tables, benches that wrap around themselves, and tops that lose their usual solid consistency to become liquid, induce people to reflect on the complexity of the contemporary psycho-social condition.

Many relational urban furnishings, on the other hand, have a functional as well as a speculative intent because they encourage sharing and proxemics [22] such as the S-shaped bench called Paul&Paula designed and self-produced by Berlin-based designer Jan-Erik Urban, which facilitates conversation, work or shared meals and the exchange of glances while ensuring a filter between bodies.

For interiors, on the other hand, there are a number of experiments that lead to sharing and creating private niches in collective spaces such as co-working spaces, such as the Confession project by Swedish designer Nick Ross, which consists of a high table with a sort of hat with an acoustic absorber that incorporates the heads of two people while leaving the bodies uncovered to allow private conversations in crowded places. The same approach has been used in the project Bar Non-Lieudi by the Viennese design studio Breaded Escalopeha, which has reinterpreted the concept of the mobile bar by making it habitable and enveloping to give two people the possibility of having a drink in a dimension of privacy.

Although they favor the material component, some of these designs nevertheless incorporate a technological part necessary to draw attention and initiate interaction. One example is the Living Light lamp designed by Joon&Jung in the shape of a flower, which, through a sensor system, modulates its degree of openness, light intensity and color, according to the amount of people present under its diameter, until it closes and turns off completely when no one is around to avoid to waste energy.

In the domestic and family sphere, numerous designers have proposed furniture that includes a playful component to consolidate relationships by relying on the possibility of reconnecting through sharing a fun experience. The Tafelwip project by Dutch designer Marleen Jansen, is a seat integrated with the table, similar to a playground swing, so if one of the two jumps up, the other loses balance and is likely to fall. An ironic way to prompt reflection on the importance of balance in relationships and the importance of paying attention to others, gaining awareness of sentimental bonds, and the effect of actions and behaviors on others' lives and emotions.

Another Increasingly popular product is ‘friendship lamps’, a type of lamp of which several versions have been made, which work through an application that allows people who own these lamps to communicate their emotions from a distance by sending color, light, and sound inputs to their friends' lamps.

Hybrid relational design

In response to this scenario, the research activities conducted within the Hybrid Design Lab aim to mediate relationships through the management of multisensory modes of interaction and the encoding of signals with a high emotional component, with a focus on multisensory interactions.

The designed artifacts are proposed as agents that induce people, their behaviors and thoughts, toward directions and approaches that facilitate communication, empathy, mutual understanding, cohesion, and collaboration processes. It is, moreover, to improve the quality of relationships through a Human Centered Design approach [23], which does not address people understood as mere users but, more empathetically, as individuals, whose individual identities and differences are to be valued, taking into account psycho-physical aspects, behaviors, intentions, desires, different cognitive and perceptual attitudes, in order to "increase" the possibilities of inclusion the abilities and perceptions of each.

Some of the projects developed in the Hybrid Design Lab in the field of systemic-relational design are described below in order to better describe the topics covered above.

EVE

EVE is an interactive lamp designed for domestic environments that performs the function of mediating relationships among family members to make them aware of daily emotional and relational dynamics (Fig. 1). The lamp evokes the concept of a domestic hearth amplifying the sentimental landscapes around it by detecting voices, words, moods and emotions, transmuting them into solicitations such as sounds, lights, colors, actions and movements. Specifically, through a system of voice and sound recognition modules that can be programmed with a code to be instructed to recognize certain words and sounds, benevolent tones can be discerned from hostile ones, and variations and peaks in pitch and volume can be recorded. The speech recognition module is connected to a 8x8 LED array, electromagnets, and a sound generator.

Under idle conditions, the lamp emits white light filtered by diffusers. When a positive atmosphere is perceived around those by, through laughter or affectionate words, the lamp illuminates the room it is in with a kaleidoscope of colors to amplify its beneficial and empathic effect.

In contrast, when people are arguing, EVE turns totally red, emits a subtle sound, and disrupts, as if by an explosion, separating the speaker panels as a result of the action of the magnets in the doors. With this reaction, the device brings about a distinct change in context, both visually and sonically, aimed at distracting people from the argument to induce in them an awareness of what is happening and interrupt the escalation of negativity. To be recomposed requires a minimum of two people to calmly bring it back together in a cooperative process by similarity to relationships that when they suffer disruptions require the cooperation of all concerned in order to be restored.

This effect is achieved through the programming of the electromagnet, which is instructed to remain on while the lamp is open to make it impossible for a single person to close it.

The applied material also participates in its conceptual message. The material of the diffuser elements is produced by ETE (Emulsified Thermoplastic Engineering) process , a thermoplastic technopolymer loaded with post-consumer waste from the milling of composites, fiberglass and polystyrene from the demolition of boats or buildings [24]. The design of matter, therefore, enters the design of the product by building an analogy between the regeneration of human relations and materials.

EVE is designed to draw attention to the other and to the solidity of the emotional bond emphasizing the relationship and the sharing of experiences both positive or negative feelings [25]. The awareness of one's own actions helps to improve lives of other family members as well.

Fig. 1. EVE. Design: Marzia Micelisopo. The project was coordinated by Carla Langella, with contributions from Gabriele Pontillo, Mario Malinconico, Salvatore Mallardo, Maurizio Avella.

Beatclose

Several scientific studies have shown that when people have a strong emotional bond they embrace each other, are close, and look into each other's eyes certain physiological parameters such as heart rate tend to synchronize and produce biochemicals such as oxytocin, dopamine, and vasopressin that help reduce anxiety and stress, regularize blood pressure, and sometimes even boost immunity [26]. When one cannot be physically close, these beneficial effects are missed.

The Beatclose project (Fig. 2) proposes a solution to the problem of long-distance relationships addressed in projects such as those described above (Pillow Talk, Bond) through an innovative wearable object. It is a belt that can be worn under or over clothing, capable of establishing a connection between two distant people by enabling the sharing of moments, experiences, emotions, and feelings in daily life. Worn all day long by both people, it allows them to be connected at all times and exchange mutual inputs such as heartbeat, the "squeezing" feeling of a hug, body heat, and even one's own scent.

The project was developed for people who, for work or pleasure, tend to change their place of residence often, while maintaining stable affections as well as the desire to live intensely with family and sentimental relationships in order not to lose the link with their humanity and roots [27]. Added to this need were the instances due to the social distancing imposed by the Covid19 health emergency that forced families and friends to live for even very long periods away from each other without being able to meet physically. According to Istat data, long-distance relationships are a phenomenon that involves about 8 percent of Italians, or nearly 4 million people.

The band incorporates: a system of microsensors mounted on textile supports, which allow the acquisition of income data detected by contact with the user, such as changes in body temperature and heart rate; an Arduino Nano pro board, which controls microcontrollers, accelerometer, Bluetooth boards, rechargeable batteries; an Adafruit DRV2605L Haptic Motor Controller board that controls small haptic motors to transmit vibrations and stresses similar to hand touch; micro-spindles that tighten and release a matrix of thin cables inserted into the band to simulate the hugging effect; two

films of AILOVA Pi, which heats up to return the effect of increasing body temperature and to activate the release of aromas contained in thin felts "loaded" with the scent of the loved person.

The design of the interaction between the user and the device makes use of natural gestures. The design of interactions evokes natural affective gestures. When one wraps his arms around the waist, as if simulating a hug, the other person feels a squeeze; when he caresses the belly, the other perceives warmth and scent; finally, when the heartbeat increases because of a physical effort or a strong emotion, the other feels a vibration. Such intuitive actions give the two people the feeling of being close in a new and different form of digital proximity.

Fig. 2. Beatclose. Design: Licia Maraziti. The project was coordinated by Carla Langella and Luigi Maffei with contributions from Gabriele Pontillo, Roberta Angari, and Valentina Perricone.

Riflessi

The Riflessi project **(**Fig. 3) is focused on the moment of meal as an emblem of conviviality to open up gaps of intimacy and reciprocity between people. The project consists of a dining table that incorporates a mirror in the middle band, configured and sized to allow people sitting at the table to intercept each other's gaze while eating, so as to establish involuntary eye contact. The gaze is the most expressive part of a person that enables understanding of moods and emotions. The meeting of glances provides an opportunity to overcome the barriers of opacity, inattention, and indifference observed in many families. Near the mirror, the table is covered with thermochromic black paint, with a transition temperature close to body temperature that invites people to push their hands beyond the boundary of their station to determine the color change until they touch each other's hands. Fostering the chance meeting of glances and hands amounts, braking distances, provoking mutual attention, re-establishing contact to recall lost proximity, how it feels to be close. A way to rediscover the resilience of human relationships, of intersubjectivity, to realize that we are repositories of a depth that was impossible to realize on our own [28].

Fig. 3. Riflessi. Design: Marina Rinaldi. The project was coordinated by Carla Langella.

Hybrid-ism & Multi-Ethnicity

The project was developed in the course Hybrid-ism & Multi-Ethnicity, taught in two editions in 2014 and 2015, as part of an International Exchange proposed by Mariella Poli, from the California College of Arts in San Francisco, between CCA students and design students from the Second University of Naples, as part of the Hybrid Design Lab. The focus of the action was the comparison between Naples and San Francisco in terms of immigration issues, cultural hybridizations between rituals, habits, knowledge, strategies, and tools for tolerance, as well as the interchange of cultures. The course flowed into two expositions of the results for each year, held in both San Francisco and Science City. The first step toward the project consisted of in-depth knowledge of data, official and unofficial, on immigration in Naples, its size, characteristics, and local specificities, as well as the living and working conditions of the immigrants present. In the Neapolitan capital there are 68,000 immigrants, mainly from countries in Asia (45 percent), Eastern Europe (37 percent), Africa (11 percent), and Latin America (7 percent). One in four immigrants in Naples is Sri Lankan, nearly one in five is Ukrainian and one in ten is Chinese. Half of the foreigners living in the Neapolitan capital come from these three countries.

The projects developed in the Hybrid Design Lab sought to open a breach in the opacity of the hectic daily Neapolitan life. Gaps of cultural and social contamination and integration through mutual awareness of Neapolitans and foreigners on the opportunities to learn from each other's cultures, on the value of listening and meeting glances for a coherent and harmonious socio-cultural cohesion.

In developing the different projects, we have chosen to propose a common approach that binds them together as a common thread, interpreting objects as cultural devices, bearers of meanings and thinking that respond to the problems identified by breaking the mold, so as to prompt users to question themselves, to prompt them to reflect on issues of hybridization. Questioning artifacts, which are proposed as opportunities to wonder about something because they appear different from what they seem, that surprise and destabilize, allowing people to pause to read his own thoughts and what they contain. As a result, the object becomes an opportunity to reflect breaking the sterile habits of thought that are the first obstacles to integration. Taken-for-granted automatisms are challenged to open fans to new opportunities and new possibilities to interpret things and diversity dialogically.

Those, become devices that make themselves bearers of the preciousness of certain cultures, which can teach the Neapolitans about different ways of seeing things, alternative solutions, ancient cultures, and layered knowledge that deserve admiration and respect.

Skin Different

The ‘Skin Different’ project (Fig. 4), is based on the diversity of skin colors of immigrants in Campania. After analyzing the most multi-ethnic passing places in which an activity of daily observation and reporting, at different times of the day, of the attitudes of passers-by was conducted. Indifference, lack of dialogue, even impatience between locals and immigrants emerged. The project was born, therefore, with the aim of transforming places of passing and indifference into places of attention and curiosity towards the different, to help break down the barriers of ethnic/cultural differences and make people understand that "diversity" is an added value. The goal of promoting rapprochement between migrants and the local community was pursued through an urban installation based on mirrors colored with shades similar to the different skin tones of the different ethnic groups in Campania, so that those who look in the mirror can see their own skin of a different color. The mirror is no longer a reflection of the self, but an instrument of identification with the other, as an urban expedient to provoke empathy, to discover with surprise, curiosity and amusement, what it feels like to pass from one's appearance to another.

Mirrors applied as transparent films outside on portions of storefronts become an element of urban ethical communication, reflecting chromatically altered identity according to skin pantone palettes. When people walk by, they are caught off guard by a different image of themselves. With their minds engaged in the hectic thoughts of everyday life, they come across as more porous, more open to transformation and empathy toward people of different ethnicities, without defenses. Skin color changes, and with it, viewpoints change. The person walks and in the transition empathizes with different ethnicities, changing skin, race and perception of others. The space transforms people and they change the space through their own reflected images. The project will have a hashtag where everyone will have the opportunity to share their photos with different skin colors.

Fig. 4. Skin Different. Design: Alessia Postiglione, with Paolo Emilio Colombo. The project was coordinated by Carla Langella.

Nausicaa&Partenope

It is a set designed for consuming both coffee and tea that integrates rituals related to domestic hospitality between Neapolitans and Moroccans (Fig. 5). According to ISTAT data, one of the largest communities in Naples is the Moroccan community, which accounts for more than 10 percent of the foreign population. Hospitality for these two cultures is a fundamental value for both cultures, but it develops in totally different ways, actions and times. In the Neapolitan culture, domestic hospitality takes place through the ritual of offering a cup of coffee, although the process from preparation to consumption is very quick, becomes a pretext to estrange oneself from the outside world and focus on conversation with the other. In Moroccan culture, on the other hand, hospitality is expressed through the ritual of the offering of green mint tea, which has a long preparation, involves predetermined actions and events, and should be drunk over a long period of time and in short sips to fully savoir the intensity.

Nausicaa&Partenope wants to hybridise and unite these two cultures, offering the possibility of sharing the ritual through the ancient gestures of hospitality with a single set. The set consists of a blown glass bottle and two small glasses that double as stackable stoppers. The bottle with its clean and minimal lines is enriched with a graphic design that reinterprets, unites, and combines the traditional patterns of Neapolitan and Moroccan culture. The transparency of the glass manages to intersect the two different patterns, creating multiple intersections and graphics at each new vantage point. The two glasses take their shape from the study and reinterpretation of the classic shape of the Moroccan tea glass and the Neapolitan coffee cup. In fact, the tea glass retains the traditionally detailed graphics, while the coffee cup is made of milk-white layered glass with a satin finish to echo the classic Neapolitan ceramic cup. In this series, the coffee cup is smaller and is placed inside the tea glass. This position emphasises the Neapolitan culture as the offspring of Moroccan culture in order to encourage respect from locals for foreigners.

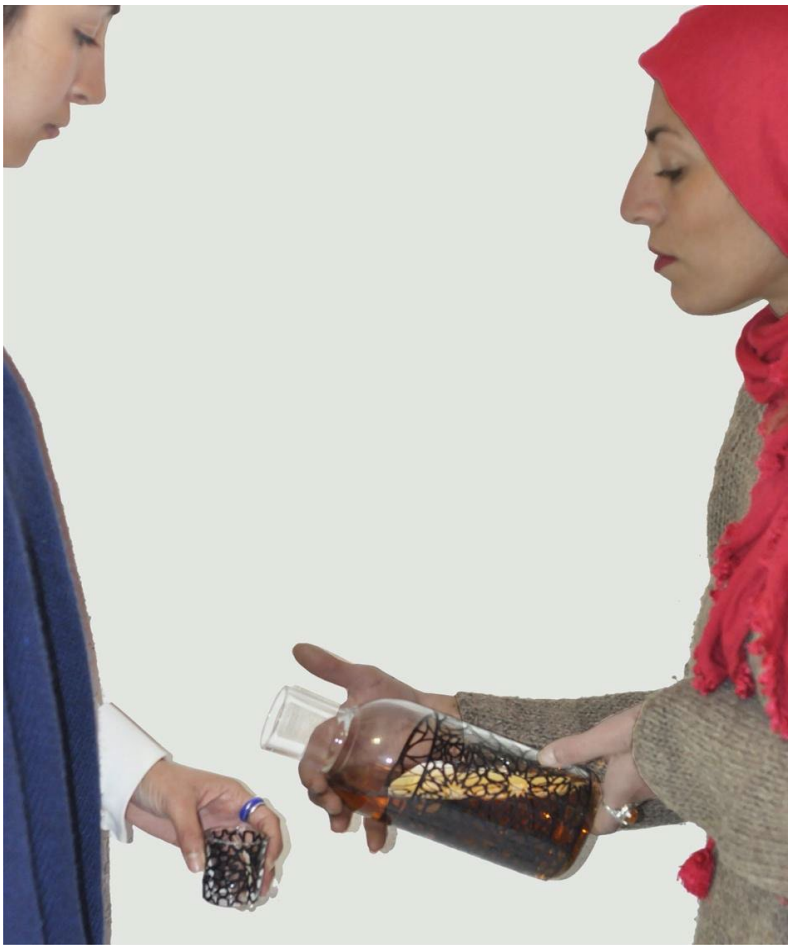

Fig. 5. Nausicaa&Partenope. Design: Sara Nappa with Francesco Dell'Aglio. The project was coordinated by Carla Langella.

Putogether

The purpose of the project is to bring together different ethnic groups in a single social event to encourage socialization, sharing, and gathering (Fig. 6). The intent is to create more opportunities that encourage interaction and integration between Neapolitan citizens and the different communities living in Naples. The project is based on the idea of devising a periodic event to be held in public places such as parks or squares where the communities present in Naples, such as Chinese, Ukrainians, Indians, Sinhalese, Poles, and Moroccans, meet with each other and with natives in order to eat together. Everyone brings food from their own country to share with others for the purpose of creating convivial complicity and thus integration. This goal is realized in an object that consists of a modular table made up of shelves with shared feet that chain together in hexagonal holes to form long tables with multiple modes of configuration: linear, alternating, circular, semi-circular, and free. Each of the shelves is treated with elements typical of the visual culture of different cultures so that everyone can recognize his or her own table and pick it up to attach it to the others. The tables can only support themselves if they are combined with each other. The interlocking becomes, thus, a sharing tool for people to interact and socialize with each other. In addition, the project also incorporated the study of different habits of sitting and eating at a table related to each ethnic community. The table leg is, in fact, also stackable so that the height of the table can be changed according to one's preferences.

Fig. 6. Putogether. Design: Teresa Iavarone with Paolo Emilio Colombo. The project was coordinated by Carla Langella.

Simen

It is an urban bench with the aim of raising awareness among Neapolitans about the migration situation in the country, creating and promoting moments of interaction between migrant and local communities and fostering intercultural exchanges (Fig. 7).

From the interviews conducted with immigrants, the meetings made with some associations and the experiences lived among the streets of Naples, it emerged that one of the most widespread problems of immigrants is the possibility of being able to tell their stories. This represents one of the main goals of the project: to create opportunities to do so through an urban game.

The objective is to make the game usable as urban furniture-game at bus stops, subway stations, or school exits, as places for people to wait and meet. Through this game, immigrants become experts in foreign lands, being able to explain the rules and give something of themselves to those who welcome them back home.

In addition, a goal of the project is also to create a time of gathering with other people who are around to watch the players, just as happens in the countries of origin of this game.

Simen features a wooden top supported by two stone bases, which accommodates both the seating of the player-adventurers and the game. It also offers the possibility of resuming the typical African way of sitting astride during the game, in addition to the standard seating.

The bench is a kind of giant Mancala board with the dips in the center to accommodate the seeds during the game.

Fig. 7. Simen. Design: Martina Panico with Francesco dell'Aglio. The project was coordinated by Carla Langella.

Conclusions

The projects described aim at improving the quality of relationships between people through awareness of the mistakes everyone makes due to busy lives, such as not dwelling on the feelings of others, the impact of one's actions and choices on others, and the state of well-being of the people with whom one interacts. Such awareness is the terrain of psychotherapy and sociology, but Design can also intervene through the ability to visually or with other kinds of sensory stimuli emphasize information and data that testify to events and relational states.

The Campania region geo-political context in which The Hybrid Design Lab is locatd, in southern Italy, has strongly conditioned the development of the systemic-relational projects. These reflect some peculiar characteristics of the territory in psycho-sociological terms such as: the aptitude for social cohesion, flexibility, adaptability, the ability to circumvent obstacles or to turn a crisis into an opportunity with alternative solutions, but also relational empathy, the tendency to collaborate and share, and the ability to condition and fascinate through storytelling.

These are all elements that constitute potentialities to be highlighted and enhanced through the design of artifacts that, through complex ways, foster these characters and translate them into attitudes and approaches to thinking.

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