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RESEARCH ARTICLE

The Experiential Niche: or, on the Difference Between Smartphone and Passenger Driver Distraction

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Abstract It is sometimes argued that since it would be absurd to outlaw passenger conversation, we should not regulate the presumably equivalent act of using the phone while driving. To reveal the spuriousness of this argument and to help urge drivers to refrain from using the phone while behind the wheel, we must draw on two decades of data on smartphone-induced driving impairment, and we need to consider ideas from both the postphenomenological and embodied cognition perspectives. In what follows, I expand on the notion of the "cognitive niche" (that is, the idea that our cognitive processes are facilitated by our human-built environments) and develop the corollary notion of the "experiential niche" to describe how our surroundings can prompt a particular phenomenological quality and organization to our lived experience. I argue that conceiving of the car as a cognitive-experiential niche is useful for articulating the crucial differences between passenger and smartphone conversation and helps make the case that we must regulate smartphone use while driving.

Keywords Postphenomenology · Distracted driving · Cognitive niche · Traffic safety · Mobile computing

Those of us who advocate against using the phone while driving have a wealth of experimental data on our side. Texting while driving has been shown to be extremely unsafe. And simply holding a conversation on the phone has also been shown to be associated with a dangerous drop in driving performance. A central finding in this empirical literature is perhaps also a surprising one: this dangerous level of driving distraction accompanies both handheld and hands-free phone conversation equally.

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Thus, the driver distraction of phone conversation does not reduce to the acts of taking one's hand off the wheel or eyes off the road; it appears instead to result from the phone conversation itself.

But there is an immediate and obvious question plaguing any advocacy effort regarding smartphone usage and traffic safety: what about the driver distraction of passenger conversation? Shouldn't the act of talking to someone in the passenger seat have the same effects on driving performance as talking on a hands-free phone? Reactionaries against the safety advocacy efforts sometimes offer the following reductio ad absurdum: if we outlaw handheld and hands-free phone conversation and also things like hands-free texting and emailing behind the wheel, then shouldn't we also require the police to pull over any driver caught chatting with the person sitting next to them? Under this line of reasoning, since it would be absurd to outlaw passenger conversation, and since it would be inconsistent to outlaw only phone conversation, we should not regulate phone use while driving.

But conversation over the phone and conversation with someone present are different experiences. They involve different distributions of cognitive demands, different embodied senses of place, and different habitually embedded structures of awareness. An understanding of these differences is crucial for recognizing why it is indeed urgently important to regulate smartphone use while driving. That is, we will need to consider not only the line of empirical research contrasting smartphone and passenger driver distraction, but also ideas from schools of thought on both embodied cognition and the phenomenology of technology.

One of the most original and useful ideas coming out of the discussion on embodied cognition is the notion of the "cognitive niche," the claim that since cognition can be facilitated by the local environment itself, our work in building that environment (and the work of others before us) shapes our minds. This idea is underappreciated in contemporary work in the phenomenology of technology, including within the particular school of thought to which I subscribe called "postphenomenology." In what follows, I expand the notion of the cognitive niche to more explicitly include issues of individual human perceptual experience, drawing on ideas from the postphenomenological perspective to develop a conception of what can be called a user's "experiential niche."

My suggestion is that a useful way to draw out the differences between the experience of using the phone and the experience of conversing with a passenger is to conceive of the car as a cognitive-experiential niche. That is, to understand how it can be different for a driver to talk to someone on the phone and someone there with them in the cab, we will need to think about how the cognitive work of driving is distributed across the car itself and the passenger in specific ways, and also how the relation to the car and the passenger informs the *quality* of the driver's experience: what stands forward to the driver as relevant, what gets overlooked, as well as the driver's experience of place. In a series of papers over the past few years, I have developed an original postphenomenological account of smartphone-induced driving impairment, one that compliments thinking in cognitive science and that offers an original take on the experimental data (e.g., Rosenberger 2012, 2013a, b, 2014, 2015). In what follows, this account is expanded through the development of a conception of the space of the cab as a cognitive-experiential niche for the purpose of addressing the issue of passenger distraction.

In the first section, I review the postphenomenological framework of concepts relevant to what follows. The second section is a brief review of the empirical data on cell-phone-induced driving impairment. In the third section, I contrast what I take to be the main general theory coming out of the empirical studies, what I will refer to here as "the cognitive distraction theory," and contrast it with my own postphenomenological account of those same data, what can be called "the experiential distraction theory." The fourth section builds on ideas from the embodied cognition tradition, especially the work of Lambros Malafouris and Andy Clark. After considering the embodied cognition notion of the "cognitive niche," I develop the corollary notion of the "experiential niche." Section five reviews the empirical studies contrasting smartphone and passenger distraction, and section six develops an account of these differences based on a conception of the car itself as a cognitive-experiential niche.

1 The Field of Awareness

The postphenomenological school of thought, based on Don Ihde's corpus of work, develops ways to conceive of the practical experiential relationships people develop with technologies (e.g., Ihde 2009, 2016; Verbeek 2011; Hasse 2015; Rosenberger and Verbeek 2015; Irwin 2016; Wellner 2016; Aagaard 2017). To explore issues of smartphones and traffic safety, it will be helpful to review Ihde's account of technological mediation and embodiment, as well as my own conception of the ways that technology usage can shape a person's awareness and how such structures of awareness can become set within bodily perceptual habits.

Under a postphenomenological conception of technology, a person encounters the world through technological mediation. Technologies transform a user's capacities to act and perceive a simultaneously transformed world. As Peter-Paul Verbeek puts it, the user and the world are both together "constituted" by technological mediation (2011, 15).

One central way that postphenomenology conceives of technological mediation is in terms of Ihde's account of what could be called the various "forms" of human-technology relations. For example, building on the history of classical phenomenology, especially the work of Martin Heidegger and Maurice Merleau-Ponty, Ihde identifies what he calls "embodiment relations." In this form of human-technology relation, a user's actions and perceptions are transformed as the device is "taken into our very bodily experience" (Ihde 2009, 42). As postphenomenological anthropologist Cathrine Hasse puts it, "Following Merleau-Ponty's dissolving of the mind-body distinction could mean recognition of the body as the specific site where consciousness and the material world conflate in one conceptual anthropological space" (Hasse 2015, 110). For instance, a pair of glasses are not simply one of the things that a user looks at; the glasses transform a user's visual experience as they are worn.

Contrast this with Ihde's notion of "hermeneutic relations," in which a user perceives the device directly in order to receive a transformed encounter with the world (2009, 43). In these cases, the user looks at, listens to, or otherwise perceives the device itself and interprets its readout. As media theorist Stacey Irwin explains, "This kind of relation calls on our linguistic abilities and our capacities to read through the technology, but also toward the technology in an interpreting way. I am now again on one side

and technology is on the other side, but I am reading and communicating hermeneutically in the in-between-ness of the relation" (2016, 26). For example, a user looks directly at and interprets a thermometer to better gain access to the precise temperature. A driver glances to the dashboard gauges to immediately ascertain speed, gas level, etc.[1]

I have expanded this framework in an attempt to develop a postphenomenological "field theory," that is, a deep description of a user's awareness as it is organized by technological mediation. The question is how do human-technology relations give particular shape to a user's "field of awareness"? How is a user's awareness "reorganized" by technology usage? As a particular technology is used, what stands forward as most present, what goes largely unnoticed, and how is a user's awareness overall restructured?[2]

There could be many variables relevant to the ways that technological mediation reorganizes a user's field of awareness. I discuss three here: transparency, field composition, and sedimentation. Ihde uses the term "transparency" to refer to the particular degree to which a technology (or perhaps parts of a technology, such as aspects of its interface) withdraws into the background of awareness as it is used.[3] For example, if a user is deeply familiar with a device, or is perhaps deeply engrossed in usage, the device itself may draw back and become less noticed. The wearer of a pair of glasses may be barely aware of the glasses themselves as they are worn, even as they transform the wearer's entire visual experience.[4]

Driving a car is an example of an embodiment relation to technology which often involves a deeply transparent experience of many aspects of the device. Hubert Dreyfus describes this experience:

[1] Ihde has articulated further "forms" of human-technology relations, including "background relations" (which refer to technologies that make up our built environmental context) and "alterity relations" (which refer to technologies that call forth a kind of presence of their own) (2009, 43). Diane Michelfelder has recently helpfully challenged this line of thinking to find better ways to articulate how "smart home" and other advanced computerized contexts can shape and extend user experience (2015). And Peter-Paul Verbeek has provocatively expanded Ihde's list to consider the potential for "cyborg relations," including bodily implants and advanced reactive environments (2011). Both this present paper with its development of the notion of the experiential niche and the paper by Aydin et al. (2018) in the present special issue attempt to address Michelfelder's challenge in different ways.

[2] Classical phenomenologist Aron Gurwitsch similarly wrote about what he called the "field of consciousness." While I draw inspiration from Gurwitsch's perspective, I do not adopt his account, and I use the term "field of awareness" to put a little distance between his account and mine. But directly following Gurwitsch, I use the term "organization" to refer to the structural arrangement of one's field (1964).

[3] Ihde's notions of embodiment and transparency owe a substantial debt to Heidegger's account of tool use and his notion of readiness-to-hand (Heidegger 1996). But in developing a series "forms" of human-technology relations in addition to embodiment, Ihde is also attempting to showcase the variability possible for technological mediation, a variability which he often casts as a direct critique of Heidegger. In adopting a postphenomenological vocabulary, it is important to acknowledge this Heideggerian precedent, but also to be clear that ultimately the philosophical commitments of this paper are to the American pragmatism of postphenomenology and not to Heidegger's more foundational account of the modes of being.

[4] I am casting the notion of transparency here explicitly as a variable, one among others that can be identified. I think this is probably ultimately consistent with Ihde's conception, although he sometimes writes about transparency as if it is a constitutive feature of embodiment relations. Also, while I will not explore it further in this article, elsewhere, I have considered an additional variable which can be called "forefrontedness," which is a kind of corollary to the notion of transparency and which refers to aspects of experience that stand forward with significance within a user's overall field of awareness (e.g., Rosenberger 2017).

> The expert driver not only feels in the seat of his pants when the speed is critical and too fast; given the other components of the situation that are experienced as relevant, he knows how to perform the appropriate action without calculating and comparing alternatives. On the off-ramp, his foot simply lifts off the accelerator and applies the appropriate pressure to the brake. What must be done, simply is done (2009, 36).

Safe driving requires a deeply transparent relation to the car's interface; a driver must remain more aware of the road ahead and less explicitly mindful of the steering wheel, pedals, and other aspects of the car's interface themselves.

More than simply discussing whether a device takes on more or less transparency, we can also consider whether a particular human-technology relation structurally reorganizes a user's field of awareness. In various ways and to different degrees, a user's field of awareness may be "composed" by technology usage. Conceived as a variable of technological mediation like transparency above, we can consider how human-technology relations may be subject to "field composition." For example, for an experienced driver certain aspects of the driving experience compose her or his awareness, constituting the large part of what is present, such as the view through the windshield and within mirrors and the sounds of the roadway.

Bring to mind the experience of sitting in a theater and becoming engrossed in a movie on the big screen. Immersed in the movie, certain aspects of the experience stand forward with an almost unignorable significance, and many others drop back unnoticed. Absorbed in the movie's content, the viewer may come to take less and less notice of the dark room all around, the theater seating, the borders of the screen, and the bumpy expanse of the backs of the heads of other viewers ahead between this person and the screen. It seems inadequate to merely say that these various aspects of the theater all become transparent or that the movie itself is simply now somehow more noticeable. It seems better to say that this relation to technology reorganizes the viewer's overall field of awareness. The movie itself, at least in moments of considerable immersion, stands forward to such an extent that it overtakes the user's awareness almost entirely. While immersed, the viewer's field of awareness becomes largely composed by the visual and audio content of the movie.[5]

One further variable important to our investigation here is what could be called "sedimentation." This term is used throughout the phenomenological tradition to refer to the way that our past experiences collect in our minds and remain present in a way that our experiences occur within an immediate context of meaning.[6] I would like to use it here as a kind of meta-variable of human-technology relations. Let us use the term sedimentation to refer to the degree to which particular structures of experience have become set within a user's bodily perceptual habits. It is the degree to which it has become automatic for a user to approach a particular device through a particular organization of experience, with a particular field composition, and particular aspects of usage taking on particular levels of transparency.

[5] Another case in which the notion of field composition proves useful is in the analysis of reading practices. In order to conceive of what it means to become immersed in a book and to consider the potential differences of reading online and reading printed text, it is helpful to consider reading as a human-technology relation with the potential to reorganize a user's field of awareness (Rosenberger 2017).

[6] For example, Maurice Merleau-Ponty uses the term in this manner (see, e.g., 1962, 131).

For example, for the accustomed glasses wearer, the device may take on a high degree of transparency with an immediacy and stubbornness reflective of the fact that this relation is highly sedimented in bodily perceptual habit. The accustomed driver will have a highly sedimented relation to the car, having developed bodily perceptual habits through which the steering wheel remains strongly transparent, and the driver's field of awareness is composed mainly by the view through the windshield and mirrors, the sense of the roadway, and the sounds of the car, all with an automaticity reflective of this person's history in the driver's seat.[7]

2 Smartphone Driving Impairment

In 2015 and 2016, the USA saw a tragic increase in traffic fatalities (National Center for Statistics and Analysis 2016). The reason for this increase is not yet clear, but many point the finger at the driver distraction of smartphones and dashboard infotainment systems that enable drivers to call, text, email, and otherwise stay in touch with others outside the car. Traffic law in the USA and worldwide has struggled to keep up with the distraction of continually evolving mobile communications and computing devices. Laws against texting while driving have proliferated across the globe. And some countries and some states in the USA have banned handheld phone conversation while behind the wheel.[8] But hands-free smartphone and dashboard computing remain largely unregulated.

These worldwide trends in traffic law run counter to the findings of more than two decades of empirical study. Through the examination of driver behaviors on test tracks, sequestered roadways, and within driving simulations, such studies examine a variety of driver behaviors purportedly related to risky driving, including changes in braking distance, headway, lane maintenance, and reaction time. The consistent finding is that both handheld and hands-free phone conversation are associated with the same dangerous levels of driver distraction (for meta-analyses, see, e.g., Horrey and Wickens 2006; McCartt et al. 2006; Caird et al. 2008). Leading epidemiological studies, which compare phone records and crash data, find that using the phone while driving increases accident risk by as much as a factor of four (Redelmeier and Tibshirani 1997; McAvoy et al. 2005). Simulator studies have found impairment levels to be comparable to driving while intoxicated (Strayer et al. 2006; Leung et al. 2012). Texting while driving has been found to be the most dangerous of these behaviors (for a meta-analysis, see Caird et al. 2014). And recent studies reveal that voice-translation devices that enable hands-free text messages, email, and social media composition are also dangerous sources of driver distraction, possibly even the most dangerous of all (e.g., Yager 2013; Strayer et al. 2014).

What is more, drivers themselves have been shown to be poor judges of their own level of smartphone-related driving impairment (e.g., Horrey et al. 2008; Sanbonmatsu et al. 2016; Terry and Terry 2016). For example, as Christopher P. Terry and Danielle L.

[7] For a parallel project that explores the sedimentation involved in the classroom distraction of computing devices, see (e.g., Aagaard 2015).

[8] For a worldwide list of phone and driving regulations, see: http://www.cellular-news.com/car_bans/
For laws state by state in the USA, see: http://www.ghsa.org/state-laws/issues/Distracted-Driving

Terry summarize, "research has shown that drivers are often unaware of the degree to which their use of a cell phone actually affects their driving performance and young drivers in particular may be poorly calibrated to estimating the magnitude of these effects" (2016, 118). Your own confidence in your ability to use the phone while driving is not itself a reliable indicator of your actual ability to do so.

3 Cognitive and Experiential Distraction

The experimental data appear to show that smartphone use causes a dangerous level of driving impairment. But these data cannot by themselves account for *why* this impairment occurs. It has been my contention that a general theory of how cell phone usage results in driving impairment can be abstracted from the language that empirical researchers use to report the results of their studies. We can refer to this as the "theory of cognitive distraction." I have developed an alternative reading of these same data, one that is based on postphenomenological theory, and that agrees that smartphone usage causes a dangerous drop in driving performance, but that offers a different account of why this drop occurs. We can refer to this alternative account as the "theory of experiential distraction."

The empirical researchers studying smartphones and driving tend to work in the field of cognitive science and many within the human factors specialization. Many of these researchers tend to report their findings in terms of a particular conception of the human mind, one that understands a mind to possess only a limited quantity of resources to devote to a given task. The act of using the phone while driving is considered a "dual task scenario" since it involves the simultaneous performance of two cognitively demanding activities: talking on the phone and operating the vehicle. Under this view, each of these tasks drains a driver's limited store of mental resources, and the act of performing both tasks at the same time is understood to be so draining that it threatens competent performance. The particular type of "resource" at issue depends on which paper you are reading. Sometimes the driver is understood to lack the "information processing" power to adequately perform both tasks at once. Other times, the driver lacks a sufficient quantity of "attention" to devote to each task. Often the drop in driving performance is attributed to an inherently limited stock of "cognitive resources."[9] Sometimes in these accounts, it is the human brain in particular that is specifically identified as the thing saddled with these limitations.

In any case, according to what we are here referring to as the "theory of cognitive distraction," the drop in driving performance associated with smartphone usage is due to our inherent inability to multitask.

The empirical studies largely produce behavioral data, measuring things like breaking distance, missed cues, and lane maintenance, among other factors related to traffic safety. And yet the write-ups of these studies at times give the impression that cognitive limitations are somehow being observed directly. While it may of course be true that the decrements to driving performance are the result of inherent limitations in drivers'

[9] For a series of quotations from a variety of articles in this empirical literature that exemplify this tendency to report behavioral findings in terms of a language of cognitive or attentional resource limitations, see Rosenberger 2012, footnote 12.

cognitive resources, a goal of my research on this topic has been to reveal this manner of casting these data to be exactly what it is: a theory. Thus my challenge has been to develop an alternative theory of these same data but without relying on a conceptual architecture of brains, cognitive structures, information processing, and resource limitations.

To do so, I have developed a postphenomenological account of using the phone and of the kind of distraction that occurs when someone uses the phone while driving (e.g., Rosenberger 2012, 2013a, b, 2014, 2015). This account, which we can call the "theory of experiential distraction," does not dispute the data themselves; I agree that these studies show that smartphone use while driving is a dangerous activity and one that must be urgently addressed by traffic law and consciousness raising efforts. The experiential distraction theory is posed specifically as an alternative to the cognitive distraction theory.

Think about the experience of holding a conversation on a smartphone while standing alone in a room. Phone conversation can be conceived as an embodiment relation to technology. As a user embodies the phone, it transforms her or his ability to verbally communicate with another person at another location. In addition to this transformation of ability, we can also consider the transformation of the organization of the user's awareness. For example, we could consider the level of transparency of the phone itself in hand. If a user has at least some familiarity with phone usage, then the device itself may often take on a considerable degree of transparency. The phone itself and the action of gripping it are not things that take up an explicit presence in the user's overall experience of engaging in phone conversation.

However, perhaps the most salient aspect of the phenomenological quality of the experience of talking on the phone is the capacity for immersion. Of course, not all moments of all phone conversations capture all of our attention. But phone conversation can indeed at times be deeply captivating. We could say that the content of the conversation, the work of holding that conversation, and the presence of that human interlocutor on the other end of the line are all things that together stand forward as significant. These aspects of the phone conversation can stand forward to such a degree that they can at times almost completely overtake the user's field of awareness. In such moments, the user's awareness is almost entirely occupied, captured, or "composed" by the phone conversation. If our example is a user standing alone in a room, then while engrossed in phone conversation, this person may not actively see objects there in front of them (say, the details of the paintings or pictures on the wall), even if their eyes remain open and pointed ahead.

We can also consider how strongly sedimented these particular experiential structures may be. How firmly set in bodily perceptual habit are these relationships to the phone? Of course this will depend on the individual and their particular personal history with phones. But I suggest that for the most part for most people with long histories of phone usage, there will be a strong habitual inclination to experience the phone itself as highly transparent and also a strong inclination for the user's field of awareness as a whole to become almost entirely composed by the experience of the conversation (especially in situations where the conversation context is engaging and/or things happening in the local environment are not). Put differently, my suggestion is that people often experience low-situational awareness while on the phone because of learned phone-related bodily perceptual habits that incline the user's field of awareness to become almost entirely occupied by conversation content.

A theoretical account of the data on smartphone-induced driving impairment can be built upon this conception of the sedimented field composition of phone usage. Under this account, rather than appeal to the inherent cognitive limitations of the human brain, the appeal is made instead to the individual user's learned perceptual habituation. I suggest that smartphone usage causes driving distraction as a user is pulled by habit into a field of awareness mostly occupied by the conversation, rather than the road. Precisely because smartphone usage is so deeply sedimented, the pull to distraction can be both strong and sneaky, like the unconscious tug of a bad habit.[10]

We could say that under this account, cell phone driving impairment is the result of a kind of "experiential distraction," rather than cognitive distraction. Even in the case of a driver that commits to continuously paying careful attention to the road ahead, the habits of phone usage can creep in and undermine this commitment. For example, if the road conditions grow uninteresting and/or the conversation content becomes captivating, then the driver's awareness overall may be tugged inadvertently by habit away from the road.

Several things can be noted about this experiential distraction account of smartphone-induced driving impairment. For one, we can observe that both the cognitive and experiential accounts apply to handheld and hands-free phone conversation. Both accounts together oppose any position that understands impairment to result only from taking eyes off the road or hands off the wheel; both understand driving performance to result from the conversation itself. Thus both together see those laws that ban only handheld phone usage to be incomplete, not going far enough to address the cause of driver distraction and thus leaving some behaviors—i.e., hands-free phone usage—dangerously unregulated. Also, since the cognitive distraction and experiential distraction accounts each offer a different theory of why smartphone usage has been shown to be correlated with a drop in driving performance, it is at least possible that some kind of hybrid explanation could be called for. But I am not aware of any specific evidence favoring one account over the other or that favors a combined explanation.

4 On Cognitive and Experiential Niches

Work in embodied cognition attempts to articulate how the human mind has evolved in connection with the development of our surrounding material ecology. Some theorists even maintain that the mind should at times be understood to be in part external to the human brain, distributed across particular objects of a person's environment, a position referred to as the "extended mind thesis" (see Clark and Chalmers 1998; Malafouris 2013). There is at least a broad attunement here between extended cognition theories, classical phenomenology, and postphenomenology, as all abandon the notion that we should think about the mind as something exclusively nested inside the human skull. Postphenomenology and embodied cognition accounts together share a thematic focus on the relationships that human beings maintain with their everyday technologies.

[10] An appreciation for the role of habituation is also developing within cognitive psychology, especially by Joseph Bayer, Scott Campbell, and their colleagues (e.g., Bayer et al. 2016) and even in its application to texting while driving (e.g., Panek et al. 2015).

A distinct version of these ideas is offered by Lambros Malafouris (e.g., 2013). Malafouris critiques the assumptions made by traditional work in cognitive archeology and argues that we must adopt an extended mind perspective to understand the evolution of our species. As he declares, "our deeply entrenched assumptions about the intracranial ontological boundaries of human cognition should be resisted" (Malafouris 2013, 37). This constitutes a significant re-conception of exactly what it is that archeologists dig up out of the ground; rather than only the behavioral after effects of our mental activities, those unearthed artifacts should be understood as actual aspects of our ancestors' extended minds.

In discussions of evolution, there has been recent interest in the role of niche construction, i.e., the potentially under-appreciated role of a species' construction of its local niche on the evolutionary process (e.g., Lewontin 2000; Odling-Smee et al. 2003; Scott-Phillips et al. 2013; Sterelny 2005). Work in embodied cognition has further elaborated how these ideas apply to the evolution of the human mind. If human cognition is facilitated by the objects of its local environment and if that environment has been constructed through a history of others building and tailoring those objects, then these environments constitute a kind of "cognitive niche." Andy Clark has explained that the cognitive niche can be "defined as the process by which animals build physical structures that transform problem spaces in ways that aid (or sometimes impede) thinking and reasoning about some target domain or domains" (Clark 2010, 62). He gives the helpful example of kitchen drawer organization. By keeping different types of kitchen implements in different drawers (say, by storing all our knives together in a knife drawer), we effectively offload to our storage routine the task of remembering exactly where each implement is located. You do not need to remember where an individual knife has been stored in the kitchen; you simply need to remember which drawer is the knife drawer and then search for it in there. The mental work of memory is thus augmented through the cognitive niche of the kitchen.

It should be noted that the development of cognitive niches occurs not only across the evolution of our species, but also across our own lifespans as we build and adapt to our environment. Steven Pinker explains that cognitive niches, "arise by mental design and are deployed, tested, and fine-tuned by feedback in the lifetimes of individuals, rather than arising by random mutation and being tuned over generations by the slow feedback of differential survival and reproduction" (2010, 8994). We work with our environments to achieve our ends and rely on objects in our surroundings to transform our cognitive processes. It should be noted as well that the notion of cognitive niches is not dependent on the extended mind thesis; it can be useful to think about niche effects on our cognition whether or not we are committed to an understanding of our minds as metaphysically extended out through the objects of our environment.

One goal of this paper is to expand on these insights to consider the experiential components of the relationships we develop with our human-built environment. That is, I want to craft a way to conceive of how the objects of our niches not only modify our cognitive capacities, but also prompt and enhance particular aspects of the quality of human experience. In one sense, we are simply talking about a kind of ergonomics; designs of our local environment afford certain kinds of usage due to the way they conform to comfortable bodily positioning and due to their resemblance to other familiar forms of usage. But there is a deeper sense too; designs can incline our perceptual focus on particular things, predisposing other things to withdraw and shaping our field of awareness.

Return to the example of the movie theater. The forward-facing seating, the dimmed lights, and the surround sound audio system all work together to prompt the viewer to experience the film in a particular and potentially immersive way. There remain other possible ways to experience the theater. But the design of this particular human-built niche provokes and facilitates immersive movie viewership. And for the accustomed theater goer, an individual history of engagement with this niche additionally prompts this kind of immersive viewership through the force of sedimented perceptual habituation.

Let us refer to these dynamics as the "experiential niche." Together with the notion of the cognitive niche, a cognitive-experiential niche points out the way that people evolve with their social and built environment not only in terms of the level and particularity of their overall distributed cognitive functioning, but also in terms of the specific quality of their lived experience.

5 Passenger Distraction

This brings us back to the tricky topic of passenger distraction. If it is true that talking to someone on the phone can be dangerously distracting to a driver, then why should talking to a passenger there in the car be any different? Researchers explore this question.

In a simulator study, Frank A. Drews and colleagues contrast the driving performance of those conversing with a passenger and those talking on a hands-free cell phone. They analyze differences in conversation dynamics and watch for differences in driving behaviors that may be indicative of driving impairments. They report, "Overall, the study clearly documents that relative to a driving only condition, cell phone use negatively impacts lane keeping, increases the headway and leads to an impairment in a navigation task while passenger conversations have only little effect on all of the three measures" (Drews et al. 2008). And following the lead of previous studies (e.g., Guerty et al. 2004; Crundall et al. 2005), they find evidence that the complexity of the speech of passenger conversation modulates with respect to driving conditions, where cell phone speech does not. In an earlier simulation study, James Hunton and Jacob M. Rose specifically contrast their results with the claims of wireless industry lobbyists. They state that such cellular industry advocacy groups "argue that bans on cell phone use are unnecessary because drivers are also engaged in conversations with passengers. Our findings indicate that cell phone conversations are indeed more distracting that passenger conversations" (Hunton and Rose 2005, 864).[11]

Samuel G. Charlton has also used a driving simulation to compare the performance of drivers talking to passengers and talking on a hands-free cell phone. This simulation included a series of road hazards to which drivers were forced to react. He found those conversing with a passenger reacted well to such hazards (e.g., taking notice, reducing speed, suppressing conversation, and recalling the danger afterward); they operated the vehicle at a level of safety similar to drivers having no conversation at all. In contrast, drivers conversing on a cell phone took comparatively longer to notice and react and

[11] It should be noted that several early studies failed to find a difference in passenger and cell phone conversation (Nunes and Recarte 2002; Guerty et al. 2004; Laberge et al. 2004; Amado and Ulupinar 2005).

decelerate, did not suppress the conversation, and had poor recall of dangerous events (Charlton 2009). He concludes "The practical implication of these findings is clear; the idea that drivers' use of cell phones need not be restricted simply because of the impracticality of restricting equally hazardous conversations with passengers is not a viable argument" (Charlton 2009, 171). In an interesting iteration, in addition to comparing the cell phone, passenger, and "no conversation" conditions, Charlton also included a condition in which a cell phone interlocutor could see into the simulation from another room but did not sit with the driver in the cab. The addition of this visual information to the interlocutor did improve the driver's performance, but not to the same level as in-cab passenger conversation (Charlton 2009).[12]

There is of course no question that passenger interaction *can* be distracting and dangerously so. The take-away here is not that passenger conversations are always inherently perfectly safe. Studies do show that, at least when passengers in experimental situations are instructed specifically to maintain engaging conversations with the driver, passenger conversation can be comparably distracting to smartphone usage (e.g., Strayer et al. 2014). And for teens in particular, passenger interactions (followed next by cell phone conversation) are shown to be the primary cause of car accidents (e.g., Carney et al. 2015). But passenger conversation and smartphone conversation should ultimately be understood as very different phenomena. And the mere existence of the variety of potentially distracting interactions with passengers does not appear to justify inaction on the regulation of smartphone usage behind the wheel.

6 The Car as Cognitive-Experiential Niche

But what makes passenger conversation different from conversation on the phone? Both are verbal tasks. Both involve interacting with another human being while driving. There are several factors that may account for this difference.

Within the subset of the empirical literature that focuses on passenger conversation, two main reasons are posed to explain the difference in driving performance found between those conversing with passengers and those conversing on the phone. The first points to the findings that show passenger conversation leads to speech modulation. Under this line of reasoning, conversation between passengers and drivers is not as distracting because both conversation partners here tend to adjust conversation complexity in response to changes in driving conditions. The second points to the findings that show that passengers at times actively assist with the driving, such as by noticing hazards and by looking for highway exits. Under this line of reasoning, passenger conversation is less distracting because passengers assist in the work of driving, and phone interlocutors do not.

Both lines of reasoning are couched within the theory of cognitive distraction. The general assumption is that conversation—passenger or smartphone—is a cognitively demanding task that draws resources away from the performance of the task of driving.

[12] Although not investigating crash risk, a follow-up study by Jannette Maciej and colleagues explores the differences between passenger conversation and cell phone conversation in which the interlocutors in both cases have differing levels of visual access to information about driving conditions (2011). Their claim is that it is visual information—not presence in the cab—that leads to conversation modulation.

If all things were equal, then the task of talking to someone in the car and the task of talking to someone on the phone are both activities that should require the same kinds of cognitive processing costs. But the data show that all things are not equal: the conversation content is not the same (with compensatory modulation occurring in only the passenger conversation) and only passengers—and not phone interlocutors—contributing actively to the driving task. Thus the idea is that while passenger conversation does drain cognitive resources in a potentially detrimental way, this is compensated for by other behaviors.

My suggestion is that there could be more going on in addition to these factors. It may be helpful to understand the cab of the car as a technological situation that shapes the effects of passenger conversation and smartphone usage in a non-neutral manner. We can consider how drivers encounter the space of the car as one that adjusts their cognitive capacity and also as one that shapes the quality of their experience. And we can consider how the space of the car is changed with the addition of a passenger.

The car is in many ways a straightforward example of a cognitive niche. Through the work of others, developed over time, the cab affords a variety of information to the driver. Mirrors are already in place to afford views of the road beside and behind the car. Dashboard gauges are ready to provide data on speed, car condition, and fuel level, among other things. Developed and improved by others in the past, a driver enters into a space in which the surrounding objects contribute to the cognitive task of driving. (Of course objects of the roadway—the signs, speedbumps, etc.—contribute to this cognitive environment as well.) As the driver has adapted to this built environment, i.e., as this person has learned to drive, these cognitive affordances become all the more ready to perform their duty.

We can also think about how this cognitive niche is altered when it is joined by a passenger. Unlike the phone conversation, the passenger shares the local physical niche space with the driver, and together they approach the driving task. The passenger too, at least if sitting beside the driver in the front seat, is pointed forward and looks out at the road ahead. Like the way the cognitive work of driving is transformed by the instrumentation of the car, the task is additionally changed by the passenger in specific ways. Drews and colleagues make this exact observation in the discussion of their findings, asking "Does a passenger just provide cues that help to optimize the allocation of attention or does the passenger qualitatively change the way that a driver allocates attention, thereby creating a form of joint or distributed attention?" (2008, 399). The cognitive niche of the car is joined into and transformed by the passenger in a way impossible for the remotely located smartphone interlocutor.

I suggest that the car can also be helpfully understood as a paradigmatic example of an experiential niche. Through the work of others over time, the cab of the car has been constructed in a way to provoke and augment a particular quality of experience. Like the way the forward-facing seats, dimmed lights, and surround sound all prompt a specific kind of movie theater viewing experience, the design of the car similarly sets up a certain kind of experience for the driver. The forward-facing driver seat, and the view of the road surrounded by the dashboard and mirror information, sets drivers up to have their field of awareness organized in a particular way. For the experienced driver, accustomed to the relationship to the car, her or his field of awareness is positively composed of the visual experience of the road ahead, an embodied awareness of the car on the road, easy glances to the mirrors and roadway signage, and the audio cues of

driving. Aspects of experience such as the feeling of the driver's seat and seatbelt, the grip on the steering wheel, and the foot pressure on pedals all recede into various levels of transparency. This particular composition of the driver's field of awareness emerges in part through the driver's volition to drive the car, through the significance of safe and competent driving and through the sedimented meaning set within the driver's own habitual familiarity with the task of driving. But it also emerges from the construction of the car itself as an experiential niche: the cab is designed to facilitate a field of awareness of just this sort.

Again, we can also think about how this experiential niche is altered when a passenger is present in the car. Consider once more the experience of standing alone in a room while talking on the phone, immersed in conversation, and perhaps not even noticing objects on the wall ahead of you despite your eyes pointing toward them. A crucial element of this example is the stipulation that you are alone in the room. If instead you are in the room with someone else, then you may be more aware of yourself and your surroundings. You may be less inclined to become lost in the phone conversation, more inclined to remain aware of the volume of your voice. If the person with you in the room is a friend and the phone call has interrupted your interaction with them, then you may make occasional expressions toward them despite holding a conversation on the phone with someone else. You may be less inclined to become completely immersed in the phone call. (For a more adversarial example of a similar situation, recall Sartre's voyeur lost in the experience of spying through the keyhole, then suddenly becoming completely aware of himself as a body in the world when caught (1984, 349).) The experience of the passenger in the car may be similar. The presence of the passenger may actively ground the driver in the experience of driving, rather than pull them toward a separated awareness centered on the phone conversation.

In this way, we can think of the experiential niche of the car as one constitutively altered by the presence of a passenger. In other words, a passenger's presence changes the experiential niche in such a way that is not ultimately detrimental to the driving task and in such a way that may often even facilitate it. The passenger, seated and looking forward just like the driver, also contributing to the task of driving and sharing the space of the cab, can be understood to alter the driver's own sense of place and feeling of responsibility. (At least part of this seems related to what in psychology is called "social facilitation," in which the presence of an audience leads to an increased performance of certain kinds of tasks (Zajonc 1965).) Where the driver's relationship with the phone may at times incline a field of awareness largely organized around the experience of conversational content and the presence of the phone interlocutor, the act of passenger conversation may by contrast actively anchor the driver's awareness in the shared experiential niche of the car. This shared experience includes conversation content superfluous to driving, but also shared bodily presence in the space of the cab, shared work on the present task of driving, and perhaps a heightened awareness of oneself as a driver, a driver answerable for the present situation that includes a responsibility for the welfare of the passenger. More than simply offsetting the cognitive detriment resulting from the conversation task, the passenger's presence may also positively ground the driver's awareness in the space of the car as a shared experiential niche.

While it may at first seem as if passenger conversation and phone conversation are largely interchangeable since both involve talking and listening, by conceiving of the

car as a cognitive-experiential niche, we can recognize these two situations to be qualitatively different experiences.

7 Conclusion

A theme in the history of phenomenology has been the exploration of the ways that the experience of space is shaped by a variety of circumstances. Rather than understand spatial relations to be only a matter of objective distances, they should also be understood as an experience alterable by disposition, purpose, meaningfulness, and the presence of other people, among other things. Here we have considered technology's role in our lived experience of space, drawing on both a postphenomenological conception of a user's field of awareness and also an embodied cognition notion of the cognitive niche, to develop an account of the experiences of space prompted by our built environments. We have used the term "experiential niche" to refer to the way our previous efforts to shape our built environment, and the efforts of those before us, can alter the phenomenological quality of our contemporary experience. With these ideas, we can begin to articulate not only how particular spaces modify our cognitive capacities, but also how they influence the characteristics of our lived experience, activating learned perceptual habits, inclining certain organizations of awareness, and inciting some things to be encountered as meaningfully present and others to drop back with less meaning and relevance.

These concepts are not merely constructs that allow us to put certain phenomena to theory; they help to identify and articulate experiences with real-world consequences. As an example of this potential for practical application, I have attempted to show the relevance of the notions of cognitive niches and experiential niches to the contemporary debate over cell phone driver distraction. One arm of this larger discussion concerns the comparison between the driver distraction of cell phones and passengers.

Many presume that smartphone and passenger conversation should be equally distracting. Critics of efforts to regulate smartphone usage behind the wheel claim that it would be absurd to outlaw passenger conversation and would be inconsistent to target only smartphone conversation; since passenger conversation has been established as an accepted risk, they argue that the presumably equivalent smartphone conversation should also be acceptable. Thus it falls on data, and on the theoretical interpretation of that data, to explain otherwise. We have reviewed the data, and we have considered how to think about them. And as a contribution to this effort to articulate the differences between passenger and smartphone conversation, I have suggested that it is important to think of the car as a cognitive-experiential niche. When driving with a passenger, a driver's spatial experience may change. Drivers may become more grounded in the cab, more aware of their role as a driver, and more inclined to experience a shared space with the passenger. And drivers may apportion some of the cognitive tasks of driving to their passengers, cooperating in the goals of navigating and keeping watch for hazards. Drivers talking on a smartphone, in contrast, do none of these things.

This is important since, as we have seen, drivers do not always hold safe intuitions about phone use on the road, often seeing themselves as exceptions to any rule that smartphone use inhibits safe driving and ready to mistakenly assume passenger and

phone conversation to be equivalent. The work of developing ways to conceive of driver distraction can be helpful for undercutting these dangerous intuitions.

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