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Computer Multitasking in the Classroom: Training to Attend or Wander?

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Computer Multitasking in the Classroom: Training to Attend or Wander?

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DISSERTATION

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**COMPUTER MULTITASKING IN THE CLASSROOM:
TRAINING TO ATTEND OR WANDER?**

presented on April 19, 2018

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Abstract

This study aimed to examine the phenomenon of Psy.D. students' multitasking on the computer while in the classroom. Using an online survey of 45 questions, the study invited Psy.D. students from across the US to answer questions pertaining to their non-class-related use of computers in the classroom, including an exploration of their relationship with computers and the internet, feelings and judgments regarding multitasking in the classroom, and opinions on the behavior and its potential impact on their profession. A total of 166 people visited the survey with 145 respondents who answered it to completion. Of the 145 participants, 86% (125) were female, 10% (14) were male, and 3.5% (5) were non-binary. The mean age was 28.5, with ages ranging from 22 to 52 and over. Approximately 85% (124) of the respondents acknowledged multitasking on their computers or devices while in class. A significant negative relationship was found between whether or not students viewed this topic as a problem and how much time they spent multitasking in class. A significant positive relationship was found between the students' age and their level of negative judgment of others who multitask. The overall amount of neutrality and positivity towards multitasking among students was greater than expected, which illuminated this topic as being much more complex than originally conceived. This raised further questions about the current academic context within which students are multitasking, with considerations for finding ways to adapt teaching methods that can respond to ongoing neurological shifts in a new generation of students.

Keywords: computer multitasking, student distraction, student attention, student inattentiveness, therapist attention, Internet addiction

Computer Multitasking in the Classroom:

Training to Attend or Wander?

As the use of computers has become ubiquitous in our daily lives, so, it would seem, has multitasking. A report from the Kaiser Family Foundation from 2005 found that 61% of 8–18 year-olds surveyed completed their homework while attending to other media either most or some of the time (Roberts, Foehr, & Rideout, 2005). A more recent report from the same source found that these levels of multitasking had not changed significantly (Rideout, Foehr, & Roberts, 2010). Many studies in recent years have focused on the associations between frequent computer multitasking and such measures as cognitive efficiency (Ophir, Nass, & Wagner, 2009), creativity (Tapscott, 2009), and even the capacity for compassion (Immordino-Yang, McColl, Damasio, & Damasio, 2009); the results tend to range from mildly to highly concerning. Academia is no stranger to this phenomenon, and the scholarly literature is increasingly filled with studies that examine what effect computer multitasking, while in class, has on students; decreased academic outcomes tend to be the findings across the board (Fried, 2008; Gaudreau, Miranda, & Gareau, 2013; Grace-Martin & Gay, 2001; Hembrooke & Gay, 2003; Krushaar & Novak, 2010; Wurst, Smarkola, & Gaffney, 2008). In the case of students pursuing a doctoral degree in Clinical Psychology, the potential for negative impact may be increased, in that the profession being entered directly relies on the ability to pay focused attention for long stretches of time, many times per day; it also calls for the ability to express empathy, to build rapport, and to think deeply and creatively about another person. Therefore, the phenomenon of doctoral students of clinical psychology who multitask on their computers while in the classroom could, potentially, be one that has far-reaching consequences for the profession of psychotherapy. This study aimed to explore this phenomenon in order to collect a snapshot of the situation as it

currently stands. The intent was to discover how widespread classroom multitasking behavior may be, and to discern if there are any patterns related to age, gender or other demographics, what the patterns of engagement may be, and if students have judgments around this kind of behavior. This will ideally create an improved foundation of understanding of the topic in order to facilitate further study regarding impact and potential solutions.

<div align="center">**Literature Review**</div>

Effects of Computer Multitasking on Academic Outcomes

There are at least four ways in which computer multitasking in the classroom may undermine the academic progress of students of clinical psychology. First, students may learn less in class as they split their attention between the classroom material and their own private activities. Second, and speculatively, this behavior may hinder the ability to effectively attend to psychotherapy clients. Third, engaging in private multitasking may erode relationships with fellow students who rely on their collegial classmates to be attentive and focused on the learning that is intended to take place. Finally, this same behavior may also have an erosive effect on relationships with professors.

Several downsides to the prevalence of the Internet in general have been researched in depth in the past two decades. Internet addiction is now a well-known phenomenon and widely considered to be a legitimate clinical disorder (Ginige, 2017; Widyanto & Griffiths, 2006; Young, 1998). Recent research among college students suggests there may be a negative correlation between academic performance and Internet use in general (Kirschner & Karpinski, 2010; Wentworth & Middleton, 2014), although more conclusive research links actual Internet addiction, or problematic Internet use, with poorer academic outcomes (Jiang, 2014; Kakkar, Ahuja, & Dahiya, 2014; Mishra, Draus, Goreva, Leone, & Caputo, 2014; Sachitra, 2015).

Furthermore, university students today commonly use their laptops in the classroom as well, not only to take notes and supplement the class material, but also to access non-classroom related activities, such as playing games, interacting with social media, or shopping (Fried, 2008; Gay, Stefanone, Grace-Martin, & Hembrooke, 2001; Ragan, Jennings, Massey, & Doolittle, 2014). Studies have shown that those students who spend more class time engaged in non-classroom related activities may tend to have poorer academic outcomes (Gaudreau et al., 2013; Grace-Martin & Gay, 2001; Krushaar & Novak, 2010), and less satisfaction with their education overall (Wurst et al., 2008). Even those students who do not access unrelated material on their computers may be more likely to have poorer measurable outcomes if they merely sit near another student who does (Sana, Weston, & Cepeda, 2013).

Judging from the research, the phenomenon of classroom multitasking via computer or other devices appears to be widespread, and certainly includes students of clinical psychology. As evidenced from my personal experience, as well as from reports by several professors (B. Belcher-Timme, J. Fauth, & R. Peterson, personal communication, July 2015), many students who are pursuing a doctoral degree in clinical psychology at Antioch University New England are also engaging, to varying degrees, in non-classroom related activities on their computers during class time. (Full disclosure: I myself was not exempt from this behavior.) Given the national awareness of this phenomenon, this situation almost certainly extends to other Psy.D. programs across the US, although the magnitude of it has not yet been studied. This could be problematic for a number of reasons, including those previously stated, such as poorer academic outcomes and decreased satisfaction with one's educational experience. These reasons alone might be cause for concern, by potentially negatively impacting the quality of professionalism and competency that clinical psychology graduates bring to their career.

However, there are other ways that this phenomenon could have a more serious impact on the development of psychologists-in-training: by impacting one's facility with and proclivity for deep, considered thought. This has all kinds of implications, including having potential influence on rapport building, morality, social justice, and diversity issues, for example, which are addressed further in this literature review. The framework of dual-processing theories of cognition, fundamental to understanding how learning and cognition work (Evans, 2008), is presented here as an aid to illuminating the possible influences of this phenomenon on a vital competency area for those pursuing a doctoral degree in Clinical Psychology.

Dual-Processing Theory of Cognition

Dual-processing theories of cognition have been developing over the better part of the last century. William James was perhaps the first prominent psychologist to theorize about the dual nature of human attention, noting that the default position is to attend to one's environment in an easy, involuntary manner; when something in and of itself does not naturally attract attention but still needs to be addressed, a second, voluntary kind of attention is then used (James, 1892/1962). More recent neurological research supports the existence of a voluntary or directed attention, in contrast to an involuntary or non-directed attention (Kastner, De Weerd, Desimone, & Ungerleider, 1998; Mesulam, 1983). Over the past several decades, much support has developed for this theory of two contrasting kinds of attention, or ways of thinking. In the cognitive sciences, these are often referred to as System 1 (implicit) and System 2 (explicit; Evans, 2008). However, other branches of academia are not strangers to dual-processing theory; for example, N.K. Hayles, Professor of English at UCLA, refers to hyper vs. deep attention when discussing the classroom habits of her contemporary student body (Hayles, 2007).

One of the most well-known research teams to investigate the theory of cognitive

dual-processing are Tversky and Kahneman (1974), who explored the concepts of System 1 and

System 2, and the implications of each. Broadly speaking, System 1 is believed to be more

primitive and describes thinking that is done in an automatic manner, often unconsciously. This

includes processing that is vital to our survival, including scanning for danger or any kind of

environmental information that may impact our immediate well-being. It drives behaviors and

processes that are so familiar to us, due to extensive practice, that we are no longer fully aware of

every aspect of them, such as driving our car home from work, or playing the piano at a high

level. It also governs patterns of thought, assumptions, and biases of which we are not often

aware, but that may influence our decisions and behavior in ways we might not wish.

System 2 is described as a more evolved mode that engages in a thoughtful and careful

manner. It is slower, it is deliberate, and it requires a level of effort and focus that is not our

usual default setting. System 2 governs complex problem-solving and careful attentiveness. It

can also be interrupted when one's attention is captured by something else (Kahneman, 2011).

Aside from being foundational to understanding how learning happens, the framework of

dual-processing is also useful due to its relationship with moral reasoning. The existence of

System 1 in contrast to System 2 can be used to explain how judgments are often made based on

a whim rather than careful consideration. It has been shown that while people often believe they

are making moral decisions based on rational thought, it is more often the case that

snap-judgments are unconsciously at play. Biases due to the retrieveability of instances, biases of

imaginability, and biases due to illusory correlations are some of the assumptions that can

contribute to the errors in judgment of which humans are capable (Tversky & Kahneman, 1974).

Lapsley and Hill (2008) speak of the pervasiveness of System 1 heuristics (mental shortcuts) as

being responsible for "moral, legal and political error, mostly because we mistake our heuristics

for universal truths and misapply them to situations or problems that are better left to System 2

corrections" (p. 319). For this reason, dual-processing theory may help illuminate the ways in

which multitasking in the classroom could intersect with issues of social justice and morality.

This is addressed more extensively later.

The Internet, in many ways, would seem to be a perfect System 1 playground. Fast

moving, streaming information at high velocity, embedded with hyperlinks that beckon in bright

blue, the Net provides an arena that rewards quick decisions and fast-paced thought. It also

provides an environment of nearly unlimited distractions (Carr, 2010).

In contrast, although there are surely aspects of the work of psychologists that must

utilize System 1, successful psychotherapy, assessment, and consultation would appear to require

a strong facility with System 2 processing. Freud (1912) long ago coined the concept of "evenly

suspended attention" (p. 110), which refers to the act of staying present in equal manner to

everything that the patient offers within a psychotherapy hour. More recently this concept has

come to be referred to as "evenly hovering attention" (Akhtar, 2009, p. 99) and is considered to

be a cornerstone for effective psychoanalytic technique. Somewhat akin to this concept is the

ideal of mindfulness, or that quality of attention that consciously focuses on the present moment,

which is increasingly considered to be a critical aspect of a positive counseling relationship

across modalities (Brown, Ryan, & Creswell, 2007; Greason & Welfare, 2013), and a certain

asset in other aspects of psychological work. Psychologist Jeffrey Martin (1997) proposes

mindfulness as a common factor, describing it as "a state of psychological freedom that occurs

when attention remains quiet…[i]t can be shown that this process is collaboratively employed by

psychotherapist and patient within all psychotherapy orientations…" (p. 291). Cultivating evenly

hovering attention—and a mindful presence in general—in the therapy room would appear to

require the clinician to engage in System 2-style processing: deliberate, attentive, slowed-down, and held fully within the present moment. Furthermore, conducting a successful psychological assessment requires attention to detail and timing, and an ability to attend closely to the ongoing feedback of the client that informs the process as it unfolds in the moment. Mindfulness is a critical skill here as well.

Neuroplasticity

Finally, in order to better understand the ramifications of Internet use within the classroom (and in general), the concept of neuroplasticity is also important to highlight. Over the course of the 20th century, research has overturned the long-held belief that the adult brain is immutable; it has effectively been proven that the brain can be changed by the way that we use it (Doidge, 2007). The more we think or behave in certain ways, the more synaptic terminals are developed to support those thoughts and behaviors, and the easier it becomes to repeat those choices in the future (Draganski et al., 2004). In many cases, the brain can be changed in such a way that it actually desires to engage further in precisely the way it is being used. This is a well-known phenomenon in the field of addiction, whereby the release of neurotransmitters that are involved in the sensation of pleasure will tend to create changes in the receptive neurons such that a need to continue the triggering behavior is encouraged (Carlson, 2013).

Evidence of neuroplasticity in response to engagement with the Internet has been documented, with changes in brain structure occurring in as little as five hours (Small, Moody, Siddarth, & Bookheimer, 2009). However, the use of the Internet seems able to promote not just a greater facility with web surfing, but a desire for more, likely related to the increase in dopamine activity (Greenfield, 2010)—hence the addictive potential. Preliminary research suggests that compulsive use of the Internet may lead to reduced levels of dopamine receptors

(Kim et al., 2011), a process that often goes hand in hand with an increase in the prevalence of

the neurotransmitter, and one which will tend to create an addictive cycle (Carlson, 2013). The

more we use the Internet, the more we are growing our facility to use it, and the more we may be

being drawn to use that kind of faculty. "The chemically triggered synapses that link our neurons

program us, in effect, to want to keep exercising the circuits they've formed. Once we've wired

new circuitry into our brain, we long to keep it activated" (Doidge, 2007, p. 223). Essentially, the

more we multitask on the computer, the more we may get increasingly seduced into choosing to

use our brains in an easily distracted, System 1 kind of way.

Relevance for Future Psychologists

Why is this important? In the case of Psy.D. students, this phenomenon may be having a

detrimental effect that goes beyond merely missing information, or experiencing dissatisfaction

with one's academic experience. Students who are pursuing a doctoral degree in clinical

psychology are putting themselves forward into a profession that requires that they pay attention.

Not just System 1 attention, but specifically System 2 attention. For 45 to 60 minutes at a time,

or longer, many hours per day, the practicing clinical psychologist is asked to listen mindfully to

what their client brings to them, whether it be a psychotherapy hour or an administration of

cognitive testing. Consultation and supervision, tasks in which psychologists frequently engage,

also require a deep facility with System 2 attention, as matters of import are considered deeply

and thoughtfully. In addition, the competent clinician is aware of their assumptions, biases, and

their potential for countertransference (Mangione & Nadkarni, 2010). These issues require

attentiveness, care, and deep thought in order to be noticed and worked with fruitfully. Jordan

Grafman, head of the cognitive neuroscience unit at the National Institute of Neurological

Disorders and Stroke, cautions that expanding our skill in multitasking can inhibit our ability to

use our more advanced cognitive skills: "The more you multitask, the less deliberative you become: the less able to think and reason out a problem" (as quoted in Tapscott, 2009, pp. 108–109). Furthermore, research at Stanford University has shown that people who engage heavily in multitasking on the Internet tend to be more easily distracted in general by "irrelevant environmental stimuli and from irrelevant representations in memory" (Ophir et al., 2009, abstract).

Multitasking on the Internet, therefore, while simultaneously attempting to be present (or appear to be present) for a classroom lecture, likely does not further the goal of cultivating mindfulness in the therapy room, assessment administration, or supervisory hour. Students who engage in this behavior are effectively practicing the art of appearing to listen to a human being in front of them, while inwardly directing their attention to a myriad of Internet-based activities. This might not be such a big deal if it were not for evidence that shows changes in brain structure after only a handful of hours spent interacting online. With evidence growing that many students are spending multiple hours every day engaged in the System 1-friendly environment of the Internet and digital devices, not just while they are in the classroom (Lenhart, Purcell, Smith, & Zickuhr, 2010), the potential for strengthening the pull to engage with System 1 thinking is vast. As a result, students may be sacrificing the chance to deepen their comfort level and ability in System 2. Patricia Greenfield (2009), a developmental psychologist at UCLA, after conducting a meta-analysis of the effects of different kinds of media on people's intelligence, concluded the following:

> Although the visual capabilities of television, video games, and the Internet may develop impressive visual intelligence, the cost seems to be deep processing: mindful knowledge acquisition, inductive analysis, critical thinking, imagination, and reflection. (p. 71)

Sustained attention, meaningful engagement, mindful listening (a medium of knowledge acquisition), analysis, discernment, critical thinking, imagination, and reflection—these are essential skills for the clinical psychologist to perform their job competently. It may be that our multitasking in the classroom—for whatever reason, be it boredom or frustration, or prior addictive tendencies—is unwittingly diminishing some of the very skills we hope to cultivate.

The potential impact on students should be obvious. First and foremost, those students who continually engage in multitasking on the Internet while in the classroom are quite likely engaging in a kind of self-sabotage. To commit to a five-year, extremely demanding program of study in order to pursue a profession that requires careful, mindful listening and focused attention, only to use a substantial portion of classroom time to practice distractedness while appearing to pay attention, is almost certainly counter-productive. This is potentially harmful towards the goal that one assumes is being pursued; the competent and successful clinician. Less capacity for focused attention could lead to less job satisfaction and possibly poorer outcomes, impacting not only self-esteem but also livelihood.

But the ramifications of decreased capacity for System 2 thinking goes beyond the well-being of future clinicians. Their clients are also likely to be impacted. Some of the most vulnerable segments of the population—those dealing with mental illness—will be ill-served by a clinician who may appear to be attending to them, but who is actually not fully present, instead distracted by potentially irrelevant, passing thoughts. Of course, all humans are prone to distractedness at times, but those of us who have actually made a practice of it throughout our years of study will likely be even more susceptible to impatience or inattentiveness, when quiet and sustained listening is what is being called for in the moment.

This can be further illustrated by an exploration of how proficiency in the slowed-down,

carefully attentive style of System 2 thinking may enhance the likelihood of a successful

therapeutic intervention. The Division 29 task force of the APA concluded in 2001 that "the

therapy relationship…makes substantial and consistent contributions to psychotherapy outcome

independent of the specific type of treatment" (Ackerman et al., 2001, p. 495). That is, the

quality of the relationship between the therapist and client is believed to be critical to the success

of the therapy, regardless of the modality used. The report goes on to assert that there is

sufficient evidence to show that the therapeutic alliance, among other factors, is a demonstrably

effective aspect of the therapeutic relationship. Therefore, it is generally accepted that building

an effective alliance, or rapport, contributes positively to a successful therapeutic outcome.

Therapeutic presence, an essential component to building rapport, has been called the

"key to being an effective therapist" by Bugental (as quoted in Geller & Greenberg, 2002, p. 72).

Bugental describes presence as "the quality of being in a situation or relationship in which one

intends at a deep level to participate as fully as possible" (Bugental, 1992, p. 27). Here we can

see the link to the present argument revealed. A clinician who has spent many years building up

brain structures that support an inclination toward fast and frequent shifts in attention may well

struggle to maintain such an intention, however sincere their desire to do so may be. The

multitude of hours spent quickly shifting focus from one window to another will likely foster at

least some level of resistance in the therapist when they attempt to maintain steady attention in

the therapy session. This inclination to shift focus may lead to a state of distractedness that could

well be perceived by the client, if not consciously, then on an unconscious level.

Research done on client perceptions of important therapist attributes finds that clients

need to experience their therapists as listening attentively in order to foster the trust necessary for

self-disclosure (Bachelor, 1995). The client's experience of "feeling felt," one consequence of

perceiving attentive listening, is critical to developing a sense of being seen, such that the client can psychologically relax and develop greater trust in the clinician (Siegel, 2009, p. 155).

One can identify attentive listening through various aspects of body language: how the therapist makes eye contact, nods or comments at appropriate moments, and makes facial expressions that are attuned to the content and/or the affect in the room. But another effective way of communicating attentive listening is by making it clear that details are being remembered; therapists who recall what their clients say during session are better poised to reflect it back to them at a later time, and to integrate that information in clinically important ways during the course of treatment. Those who divide their attention, however, between what their clients share and their internal pull towards (or surrender to) alternative thoughts, tend to be much less able to remember the details of what has been shared. Studies have shown that dividing one's focus during the process of encoding (that is, what one is attempting to do when paying attention) has a dramatically negative effect on one's ability to recall at a later time (Schacter, 2001). Those clinicians who can more easily keep their minds fully focused on their client's narrative will therefore be better positioned to demonstrate their past attentiveness by incorporating details previously shared, and thereby strengthen the client's trust and sense of safety in the relationship, going forward.

This creation of enhanced trust and strengthened rapport contributes not only to the common factor of alliance building, but also to specific intervention techniques that rely heavily on the nature of the relationship between the therapist and the client in order to create change. For example, the psychodynamic modality of object relations utilizes the therapeutic relationship as a significant tool for healing. Object relations theory assumes that the primary drive in a person's life is to be connected to others, and that meaning making is achieved through their

relationships with the "objects," or people, in their surroundings (Mitchell & Black, 1995). The

kinds of relationships we develop with our primary caretakers greatly inform how we seek to

relate to others as adults, and we will generally recreate these dynamics in later years, regardless

of how dysfunctional they may be. According to the theory, in order to help the client form new

and more satisfying ways of creating relationships, the therapist must successfully create the kind

of holding environment that the patient would have ideally received as an infant; in essence, the

therapist attempts to be attentive and reliable, without being intrusive or overbearing. This

provides the best environment for the patient to feel safe (Curtis & Hirsch, 2011). This quality of

safety and containment allows the patient to regress, to the point where they are more likely to

project their old object view onto the therapist through the process of transference. This means

they can re-experience quite directly the old dilemmas around relating, both in terms of their

transference process onto the therapist, and also through the process of projective identification,

whereby the projections onto the therapist cause the therapist to behave in ways that appear to

justify the transference, and so illuminate the old way of relating. This process allows for insight

into the patient's functioning to be revealed (Messer & Wolitzky, 2010).

In addition to insights, object relations theory holds that the experiential meaning making

between the patient and the therapist, in the here and now, is also a critical aspect of the

mechanism of change. The patient must not only know in theory that new ways of relating are

possible, she must also have an experience of this new object relation, and know through living

them that other, more satisfying ways of relating are possible. Through the stable and nurturing

holding environment that the therapist creates, and the positive, confirmatory feedback provided,

the patient can have new and positive experiences of herself and also of others. This creates a

fuller landscape for the patient out of which she can make healthier and more integrated choices

for more satisfying relationships (Curtis & Hirsch, 2011).

Attentiveness, then, is a key element in the construction of a safe holding environment, for the therapist utilizing an object relations modality. This environment is the foundation out of which insights and new experiences can arise; the creation of a such an environment requires that the clinician's attention follows the patient's process, in much the same way that a parent would ideally follow their toddler's process, and not their own, in their child's presence. This may involve changes in focus, but at the patient's pace, not driven by the clinician. A therapist who has a strong inner drive to shift their attention according to their own timing may struggle to convince the patient that they are completely present for them, which will likely compromise their ability to create a reliable holding environment.

Simulation Entrapment

Another emerging phenomenon that may have relevance to this topic has been identified by Essig: that of "simulation entrapment" (Essig, 2012, p. 1177). Simulation entrapment is a counterpart to the notion of internet addiction, which "references experiences in which participants are no longer able to keep in mind that what is being experienced is a technologically mediated simulation of some other traditional reality" (p. 1177). In effect, the experience one has is that the simulated reality is more compelling than actual reality. One of the critical components of this phenomenon is the concept of relational embodiment, or the way that one's physical being plays a part in creating and maintaining interpersonal connections. Connections made through a digital interface can offer fully embodied experiences, but in critically different ways than real-life connections. As Essig explains:

Onscreen social connections can often have incredible power because they are not how intimacy was created when held in a caregiver's arms during infancy or how those

relationships were experienced when as children one learned to walk and

talk…[c]onsequently, onscreen social connection can become a form of relational

embodiment relatively uncontaminated by the ambivalence of early parent-infant

interaction. (p. 1178)

This phenomenon holds wide implications for students who sit in front of their laptops while

attending classes, and may have become accustomed to self-soothing in moments of boredom or

frustration by turning to their online connections. The implications may be even more serious for

students of clinical psychology, for whom a mastery of building real-time connections is vital to

their career. The need to not only cultivate a successful, in-person connection with clients, but

also to be aware of their clients' skill deficits in building relationships, would seem to be critical

to a successful outcome of interpersonal therapy and psychological work in general. Students

who may find themselves experiencing simulation entrapment in their online experiences may be

hindering their development as a therapist for reasons beyond those previously explored.

Further Implications for Clinical Psychology

  Therapeutic and supervisory relationships. An exploration of how this phenomenon

and its potential implications intersect with other critical aspects of clinical psychology is now

presented. The subject of the therapeutic relationship has been introduced previously in this

paper. The ability to sustain attention in a slow, deliberative, System 2-manner is a main

ingredient of mindfulness, which is thought to be a critical aspect of cultivating the kind of

presence necessary to create a strong therapist-client alliance (Germer, Siegel, & Fulton, 2013;

Ryan, Safran, Doran, & Muran, 2012); this idea in turn can be applied to the supervisory

relationship as well (Ryan, 2008). As previously addressed, a psychologist-in-training who

spends much of their classroom time engaged in multitasking activities while attempting (or in

some cases, not attempting) to attend to the lecture at hand, is likely deepening a propensity to

shift attention quickly. The consequences of this have already been stated but cannot be stressed

enough: a reduced ability to fully attend to the here-and-now may negatively impact therapeutic

and supervisee relationships as well as potentially detract from other psychological tasks such as

testing administration. The inattentiveness of the therapist/supervisor, consciously perceived or

not, may well contribute to lack of trust and guardedness on the part of the patient/supervisee,

which could have profound implications for therapy and training outcomes. A therapist's

inability to adequately provide evenly hovering attention will likely result in an ineffective

psychoanalytic experience for the patient and a dissatisfying training experience for the

supervisee.

Furthermore, a lack of facility with System 2 thinking may also impact the clinician's

ability to feel and convey empathy and compassion, two ingredients in building the therapeutic

relationship that are widely thought to be foundational (Rogers, 1957; Wampold, 2001). Recent

research from the University of Southern California implies that qualities such as empathy and

compassion, considered to be higher emotions, "emerge from neural processes that are inherently

slow" (A. Damasio, quoted by Marziali, 2009, online source). The study itself states:

> [I]n order for emotions about the psychological situations of others to be induced and
>
> experienced, additional time may be needed for the introspective processing of culturally
>
> shaped social knowledge. The rapidity and parallel processing of attention-requiring
>
> information, which hallmark the digital age, might reduce the frequency of full
>
> experience of such emotions, with potentially negative consequences. (Immordino-Yang
>
> et al., 2009, discussion)

While it is too early to draw strong conclusions about this particular topic, the possibility exists

that frequent multitasking on the computer may actually impact a clinician's ability to engage in empathy, which would clearly influence the therapeutic and supervisory relationship. In addition to potential skill deficits in empathy by means of an overreliance on System 1 engagement, the previously explored phenomenon of simulation entrapment may also contribute to difficulties in appropriately experiencing and expressing empathy with therapy clients and supervisees, due to a lack of practice in cultivating in-person interpersonal connections, with all its inherent non-verbal communications and body-related cues and expressions (Essig, 2012).

Competence with diversity. The subject of diversity within the field of clinical psychology is also a critical one. To be fully competent, the developing clinician must have an understanding of the multicultural landscape in which they work (Roysircar, Dobbins, & Malloy, 2009). The doctoral student must examine their assumptions and belief systems regarding many human characteristics that tend to be based on their own cultural backgrounds. It is also important for the student to develop awareness of the prevalence of judgments based on heuristics, and the implications of System 1 vs. System 2 thinking. It is then up to the student to undergo this kind of self-examination in an ongoing manner, while keeping in mind the potential errors in judgment that System 1 thinking can unconsciously create. According to Sue, Arredondo, and McDavis (1992), "A culturally skilled counselor is one who is actively engaged in the process of becoming aware of his or her own assumptions about human behavior, values, biases, pre-conceived notions, and personal limitations" (p. 481). This is a process that is critical for the competent treatment of persons of all backgrounds; it is also critical for a deeper understanding of social justice issues that may impact the lives of diverse clients.

However, simply knowing that one may be susceptible to assumptions and errors in judgment, due to System 1 thinking, is not enough to prevent those errors from being committed.

One must actively engage in a System 2-style of exploration and self-assessment, and be able to

catch oneself exhibiting System 1-related biases. In the therapy room, when faced with a client

who is culturally different, a well-meaning intervention that is unconsciously informed by the

clinician's biases can create an untenable situation for the client. The need for facility with

System 2 thinking should be clear in this situation. The clinician who is pulled to engage more in

System 1 thinking may be at greater risk for relying on assumptions and familiar stereotypes to

inform their therapeutic responses. This would tend to result in multiculturally incompetent

practice.

       Ethical implications. Looking at this phenomenon from an ethical standpoint raises a

couple of important questions as well. Upon first looking at the APA Code of Ethics published in

2002 (amended 2010), one sees in the general principles that Principles D and E can be linked to

the question of moral heuristics, which describes how people tend to use mental and moral

short-cuts (System 1 thinking) to arrive at faulty decisions and judgments (Sunstein, 2005).

Principle D (Justice) states, "Psychologists…take precautions to ensure that their potential

biases…do not lead to or condone unjust practices." Principle E (Respect for People's Rights

and Dignity) states, "Psychologists try to eliminate the effect on their work of biases based on

[age, gender, gender identity, race, ethnicity, culture, national origin, religion, sexual orientation,

disability, language and socioeconomic status]" (American Psychological Association, 2010,

General Principles, para. 6). If prolonged multitasking on the computer while in class (and

elsewhere) contributes even marginally to a deficiency in skill regarding identifying one's own

biases, it could be considered an ethical issue.

       Principle C of the code illuminates a different aspect of this phenomenon. Outlining the

principle of integrity, it states, "Psychologists do not…engage in fraud, subterfuge, or intentional

misrepresentation of fact" (APA, 2010). This invites the question, is multitasking on one's laptop during class an engagement in subterfuge? There exists an unspoken agreement between students and professors that during class time, students will place their focus on the professor and the discussion, lecture, or material that is presented. But if this agreement is not kept, does this go so far as to constitute an ethical breach? This is unclear territory that deserves further consideration. Some institutions do have policies in place; at the undergraduate level there are schools that explicitly require their students to agree not to use their computers during class time for any unrelated purposes, at risk of being dismissed from the class (J. Bosson, personal communication, July 16, 2015). It could easily be argued that multitasking on computers in such a way as to avoid discovery by the professor is in fact a kind of subterfuge. While not directly addressed in the APA code of ethics, this behavior might not be unrelated; this topic may well deserve further exploration.

Social psychology perspective. It may be interesting as well to explore possible reasons for this behavior from the perspective of social psychology. Two theories in particular seem to lend themselves well as possible contributing factors. One is the theory of social validation, which is based on Festinger's (1954) social comparison theory. Part of this theory states that people have an innate drive to evaluate themselves, and they will inform that evaluation by comparing themselves to others if objective means are not available. From this has evolved the social validation theory that individuals will tend to base their decisions regarding what is and is not appropriate behavior on how others, similar to themselves, have behaved or are currently behaving (Baumeister & Finkel, 2010). In the context of the exploration at hand, multitasking on the computer or on handheld devices may have become so commonplace in our culture that it seems to be a normal, acceptable behavior, even in the classroom.

Another social psychology theory that may underlie this behavior is that of social loafing. Groups often exhibit "a curious tendency toward underachievement" (Baumeister & Finkel, 2010, p. 516), which was first investigated by Ringelmann in the early 20th century (Kravitz & Martin, 1986). His findings were later studied and a theory of social loafing was proposed. Essentially, it states that people tend to expend less energy, whether physical or cognitive, when they are working toward a common goal in a group, than when they are alone (Latané, Williams, & Harkins, 1979). In the case of the classroom, the goal of the class may not be explicitly agreed upon, although it is likely to include some measure of information being imparted and students contributing usefully to a discussion. Although there may not be a unified purpose, there is some kind of shared experience happening, and the goal of creating a dynamic classroom environment is shared among many. Social loafing theory predicts that some if not all individuals in the class will expend less energy toward making the class successful. As has been shown, System 1 engagement requires far less energy than does System 2—therefore, attending to computer-related activities instead of to the class at hand may be all too easy to do. Unfortunately, though they may be attempting to conserve energy while participating in group-normed behaviors, students may be unwittingly compromising one of the critical skill sets they are ostensibly giving years of their lives to utilize.

Implications for Telehealth. It is interesting to note that the emerging field of psychological telehealth may be particularly vulnerable to the implications of the multitasking phenomenon. Telehealth, as the modality of delivering health care via live video chat over the Internet, has recently become a critical method for delivery of mental health care in rural areas, where access to in-person clinicians is limited (Mehrotra et al., 2017; Sampson & Mueller, 2016; Stamm, 1998). There are two ways that the delivery of telehealth may be affected by the rise in

computer multitasking and its likely impacts on attentiveness. One, given that the treatment or supervision is being delivered online through the computer, the clinician's screen is already necessarily available and completely out of the view of the other person. A psychologist who has multitasked themselves into a state of being easily pulled to further multitask is even more vulnerable to lapses in attention in this scenario as they are unable to put their device away to try to avoid temptation, and may also believe that they will not get "caught" due to the hidden nature of their screen. They will need to be vigilant about the setup of their computer, otherwise automatic notifications may unwittingly grab their attention and distract them from the task at hand. Two, it has been noted that non-verbal behaviors such as looking down or away, which when brief are generally socially acceptable in in-person settings, are much more easily interpreted as rude or distracted in a telehealth situation (Faucett, Lee, & Carter, 2017). Even briefly distracted behavior, then, will likely have an amplified negative effect on rapport and outcomes when experienced in a telehealth setting.

Research Rationale

Given the aforementioned arguments that imply this behavior could well be having a critical impact on the ability of doctoral students of Clinical Psychology to cultivate the very skills they most need to do their job well, it appeared paramount to take a closer look. This study aims to do just that, by providing a preliminary understanding of how widespread multitasking in the classroom is, who is engaging in it, and what are the beliefs, perceptions and judgments of those who both participate and witness such behavior. More specifically, this study aimed to shed light on the potential that computer multitasking in the classroom may have in undermining the ability of students to learn in the classroom, as well as the potentially erosive effect it may have on students' relationships with their professors and with each other. While this study did

not directly measure a hypothetical correlation between student multitasking and the ability to attend to clients, it did aim to illuminate a possible link and set the stage for further study if warranted.

Working Hypotheses

In addition to gathering descriptive data, there were eight working hypotheses addressed through statistical analyses of the results. They were as follows:

1. There is a negative correlation between age and multitasking behavior; that is, students who are younger are more likely to engage with the Internet at an earlier age; this hardwiring will cause them to be more likely to multitask in the classroom.

2. Of those students who do engage in multitasking on the computer while in class, those who are younger may be less aware of it, and so may not see it as an issue that needs to be addressed.

3. Older students are more likely to feel a sense of guilt around their classroom multitasking, as their relationship to computers is likely to be less integrated than it is for digital natives.

4. Older students are more likely to harbor a negative opinion of their fellow students who multitask while in class, for similar reasons.

5. There is a negative relationship between respondents' level of multitasking in class and their likelihood of viewing computer multitasking as a problem that needs to be addressed.

6. There is a positive relationship between the amount of time students spend multitasking in class and the amount of time they spend in an unfocused manner on the Internet when not in the classroom.

7. The more a respondent believes they struggle to remain present in their life, the more they are likely to multitask.

8. There is a negative relationship between the amount of time a respondent spends multitasking in the classroom, and the likelihood that they engage in a regular meditation or mindfulness practice.

Methods

Participants

Students from at least 20 APA-accredited programs and 3 non-accredited programs received the invitation from their program directors to participate in the survey (determined through email confirmation from their program director, as well as from students using their school email address to enter the raffle). There were a total of 166 visits to the survey, with 145 people answering the survey to completion. Of the 145 participants, 86% (125) were female, 10% (14) were male, 3.5% (5) were non-binary and .5% (1) chose not to disclose their gender.

Regarding the ages of the participants, the majority fell between the ages of 23 and 31 years old, with a likely mean age of 28.5. Due to the fact that the 3 respondents who were 52 or older were grouped together, no valid mean age can be assessed. However the results of the age distribution of the participants can be seen in Figure 1 below.
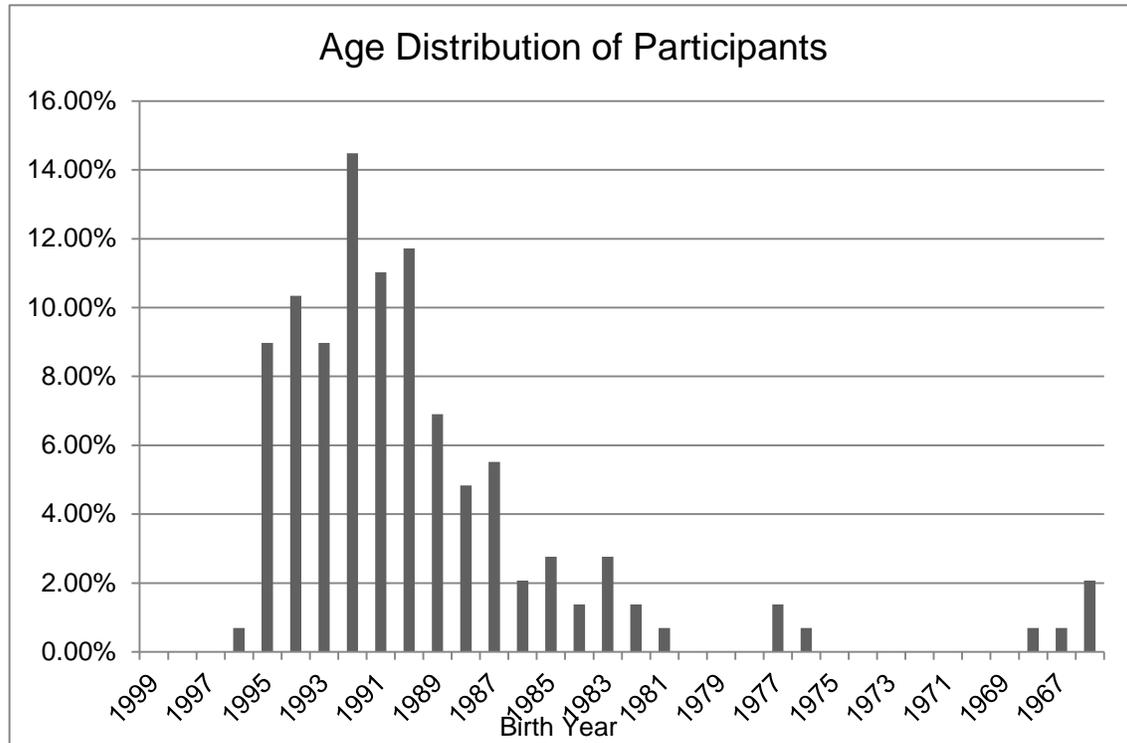
Figure 1. Age distribution of participants.

Regarding the highest level of education attained, 56% (81) had earned a Masters degree, 43% (62) had not earned a degree beyond their Bachelors, and 1% (1) had earned their JD. Just over 94% (135) were enrolled in APA-accredited programs, and 5.5% (8) were enrolled in non-APA-accredited programs. Nearly four-fifths—79% (114)—of those surveyed listed psychotherapy and assessment as their primary career goal, while 21% (30) included research as a primary career goal, alongside psychotherapy and assessment. Most of the participants were in their first three years of study, with 37.5% (54) self-identifying as first-year students, 20% (29) as second year, 29% (42) as third year, and 10.5% (15) as fourth-year students. Only 3% (4) were in their fifth year or beyond.

Geographically, participants hailed from all parts of the US, with the largest representations from the Northeast at 28.5% (41), and the West at 22% (32). The Midwest and

the Northwest were each represented by 15% of respondents (22 apiece), followed by the

Southwest at 10% (14) and the South at 9% (13).

The participants were also asked to share their ethnicity. Students identifying as White

overwhelmingly represented the largest portion of the sample at 80% (116). There were 12%

(17) who identified as Asian or Asian-American, 5% (7) who identified as Black or African

American, 3.5% (5) who identified as biracial/multiracial, and 1.5% (2) and <1% (1) identifying

as Hispanic/Latino and Native American, respectively. Some students chose not to identify or

identified as Middle Eastern (2) or Jewish (2). See Figure 2 below for the percentages of

ethnicities represented.
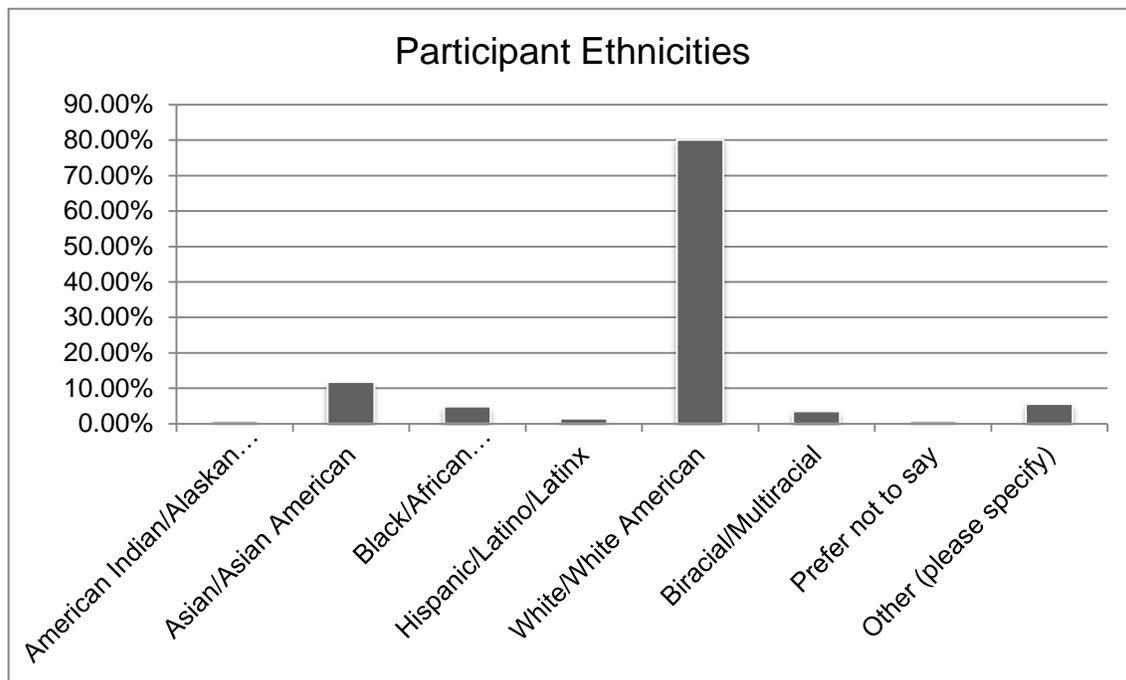
Figure 2. Participant ethnicities.

In terms of sexual orientation, 76.5% (111) participants identified as heterosexual. Nine

percent (13) identified as bisexual, 7% (10) as queer, 3% (4) as gay or lesbian, <1% (1) as

asexual, and 1.5% (2) preferred not to answer. Three percent (4) gave answers other than those

provided, either pansexual (2% [3]) or demisexual (<1% [1]). The majority of participants were

either married (19% [28]) or in a committed relationship (45.5% [66]), with 32% (46) identifying

as single.

Sampling Procedures

The survey was hosted on surveymonkey.com. Those invited to participate in the study

were students enrolled in coursework for in-person Psy.D. programs for Clinical Psychology

across the United States. Invitations were emailed to the directors of 66 APA-accredited and 10

non-APA-accredited Clinical Psychology Psy.D. programs across the US. The two

APA-accredited institutions in Puerto Rico were excluded, due to the fact that at the time of data

collection the island was still recovering from the effects of Hurricane Maria and therefore could

not be considered to be experiencing "business as usual." The program directors were informed

of the nature of the study, the approved IRB status, and were asked to forward an email to their

Psy.D. student body that included a link to the survey and relevant consent information, as well

as notification of a raffle to win one of two $50 amazon.com gift cards provided as an incentive

to those who completed the survey. Participation was completely voluntary and confidential, and

students had the option to skip questions that they were not comfortable answering. Once the

student accessed the survey, they were informed of the research and risks via a brief description,

which concluded by asking the student to give consent to participate and acknowledgement of

the nature of the research. They were also informed of the monetary incentive, and given

information about how to enter the drawing to win the gift card, which they were able to do once

they concluded the survey by sending their contact information to a separate email address

created specifically for this study. The student was then sent to the questionnaire, which was

originally estimated to take approximately 15–25 minutes to complete. The average completion

time at the end of the data collection was 12 minutes and 53 seconds. The survey remained open

for 25 days, from January 9 until February 2, 2018, inclusive.

It was originally hoped that a minimum of 85 students would complete the survey in

order to have a medium effect size for two-tailed tests when $\alpha=.05$, according to Cohen's power

primer. A total of 166 people visited the survey website, with 145 people answering the survey to

completion.

Study Design

In order to explore current trends in behavior and attitudes regarding computer

multitasking among students presently enrolled in doctoral level Clinical Psychology programs

in the US, this study used an online survey methodology. The goal of the survey was to collect a

snapshot of the demographics of such engagement (or lack thereof), namely, to discover what

kind of student is engaging in non-classroom related activities on their computer or smart device

while in the classroom. The survey aimed to detect if there are demographic trends related to

computer multitasking. There was a specific interest to see if there is a correlation between

students' ages and multitasking behavior, in order to explore the hypothesis that those students

who are considered to be digital natives are more likely to engage in computer multitasking than

are older, digital immigrants. There were questions related to the content of the multitasking, as

well as frequency, duration, and relationship to class size and perceptions of the professor.

Additionally, the survey aimed to detect trends in attitudes toward computer multitasking in the

classroom, both regarding self and fellow students, and invited reflection on the impact of such

behavior on academic and professional outcomes. The data collected is effectively in a

quantitative format, however there was an opportunity for participants to provide a small amount

of qualitative feedback if they chose to do so.

Measure

The questionnaire used was created through consultation with psychology professors and students currently enrolled in the Psy.D. program at Antioch University, New England (see Appendix A). It contained 44 questions for quantitative data collection; there was one further question at the end of the survey that invited participants to share their thoughts as qualitative data if they chose in an open-ended format. The 44 questions covered 8 general categories: 10 questions pertained to demographics, 7 questions explored the participant's relationship with computers and the internet, and 1 question differentiated those who engage in non-classroom related activities on their computer to any degree, from those who do not engage at all. For those who indicated any level of multitasking engagement while in class, there were 8 questions that investigated the frequency, setting, and nature of their non-class-related computer use, 1 multi-part question that explored different scenarios and policies that might affect this kind of use, and 5 questions that pertained to guilt and judgment around the behavior. For those who identified as not engaging in this activity, there was one question that explored their reasons why they do not do so. For all respondents, there were 6 questions that pertained to perceptions and feelings around this kind of activity, and 4 questions that pertained to mindfulness. Finally, there was one question that invited students to share any thoughts they may have on the topic as a qualitative answer. The questions were a combination of multiple choice, yes/no questions, percentages (of time) and rating scales from 0 to 100. See Table 1 for a full description of the questions included in the survey.

<div align="center">

Results

</div>

Descriptive Results

The beginning of the survey asked questions related to the respondents relationship to

computer usage in general, including information about their abilities to pay attention. A

majority of the respondents, 70% (102), indicated that they had grown up interacting with

computers from early childhood (before the age of ten). Of the 30% who had not, 75% (33)

indicated that they began interacting with computers between the ages of 12–16 years old and

14% (6) indicated that they began using computers regularly at 18 or older. Of the total

respondents, 14% (20) identified as having a diagnosis of ADHD of any kind, and 70% of them

(14) indicated it was the inattentive type alone; 15% (3) had both inattentive/hyperactive type

and 10% (2) had the hyperactive type alone.

Regarding their level of comfort in using computers, 90% (130) of respondents replied

that they were completely or mostly comfortable using computers, while 5% (7) responded that

they were mostly or very uncomfortable using computers.

The survey then asked participants to estimate how much time they spent on their

computers in a focused and directed manner per day, when not in class. The average number of

hours was 3.2, with the median and mode being 3 and a standard deviation of 1.45; the range fell

between 1 and 12 (if 12 as an outlier is removed, the high end of the range becomes 6, but the

other statistics change very little). The amount of time students spent on their computer in an

unfocused and non-directed manner, when not in class, was slightly lower, with the average

being 2.8 hours per day (median and mode of 2, range .25-10, standard deviation 1.86).

When asked if they were taking the survey while in class, 5% (7) of respondents replied

that they were. Fully 85.5% (124) of the respondents indicated that they do use their computer or

device while in school to engage in activities that are unrelated to the content of the class. The

following section, therefore, applies to this large subset of the total number of respondents, who

are referred to as "multitaskers" for the sake of brevity, even if they are focused on only one task

as long as it is not the class at hand.

      Classroom multitaskers. The most predominant type of device used in the classroom by multitaskers is a laptop computer (84% [104]). The second-most popular device (at a far distant second) is a smartphone (12%[15]) with a few relying on a tablet or iPad (3% [4]). When asked to estimate the percentage of time that they multitasked on their devices during class, the average was 20.5%, with a median of 15% and a mode of 5%, with a range of 1–100. The standard deviation was 18.3, indicating an extremely wide variety of responses (see Figure 3).
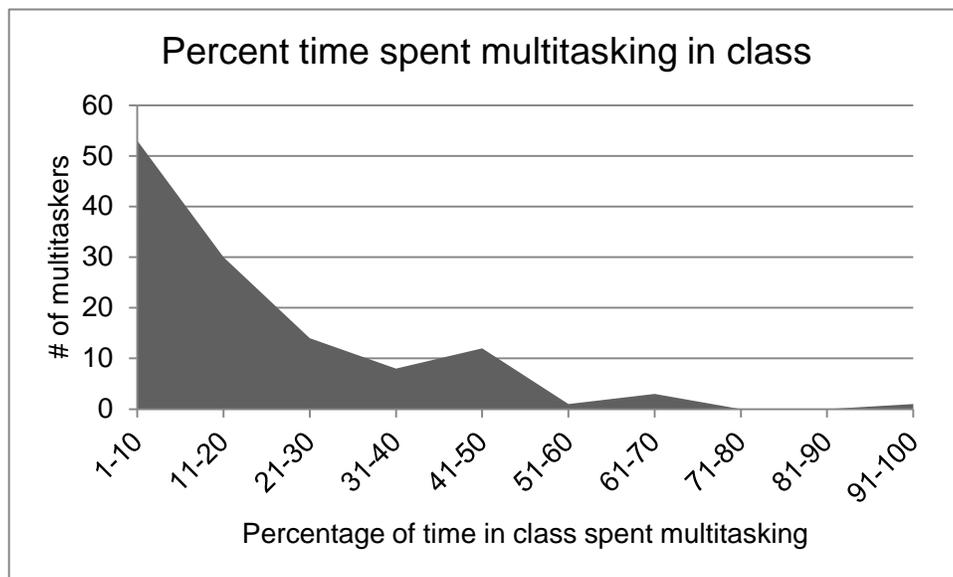
    Figure 3. Percent of time spent multitasking in class

      Respondents were then asked to describe when it is that they engage in multitasking on their device during class, and they were invited to check multiple scenarios. The most predominant scenario was indicated as "mainly when the professor has a style that doesn't work for me (e.g., boring or confusing)," which 61% (76) of the multitaskers endorsed. Nearly half—48% (58)—indicated that they engaged in multitasking in a little bit in "only one or a few classes," while 31% (38) indicated that they multitasked a little bit in "most or all my classes." Approximately 14% (17) engage in multitasking a lot but only in one or a few classes, while

2.5% (3) admitted to multitasking a lot in most or all of their classes. See Figure 4 for a more

detailed depiction of these results.
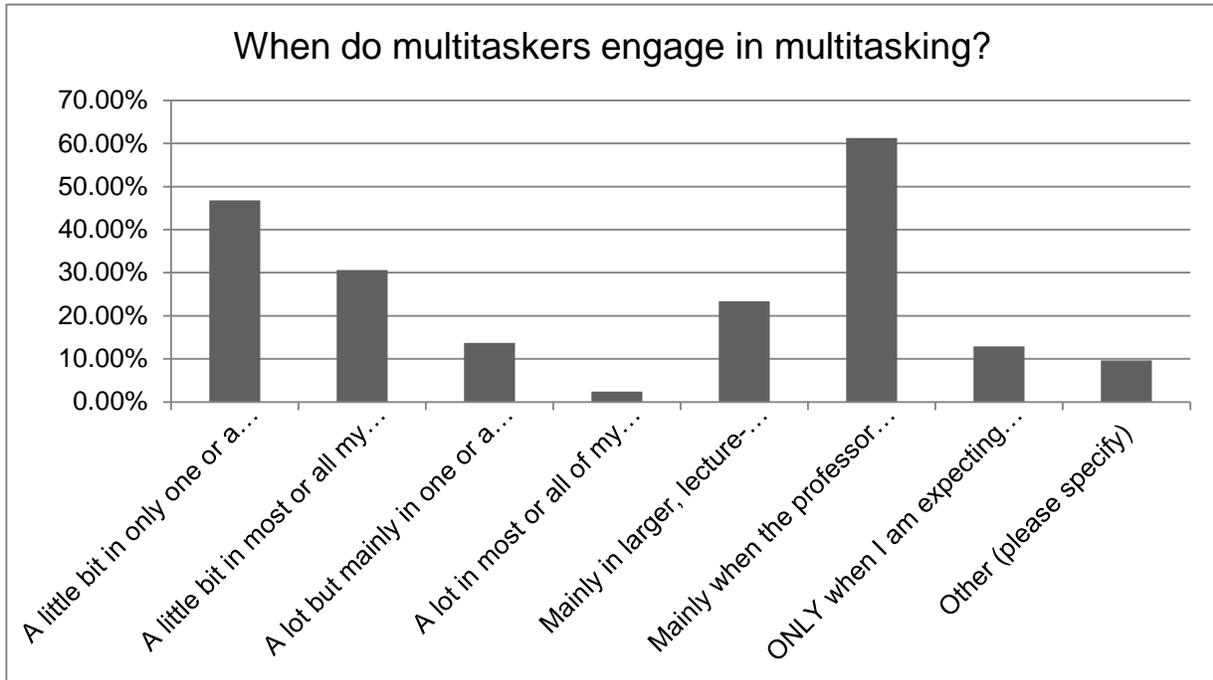
Figure 4. When do multitaskers engage in multitasking?

Of those who engage in multitasking, the most predominant activity is doing email

(28%). Chat messaging was the second most popular activity (22%) closely followed by doing

unrelated schoolwork (19%). Social media averaged 17% across respondents, followed by

shopping (6%), doing paid work (4%), and watching porn (1%) or playing video games (1%).

Approximately 10% of activities were described as "Other." See Figure 5 for a column chart

describing the breakdown of activities in which students engage.
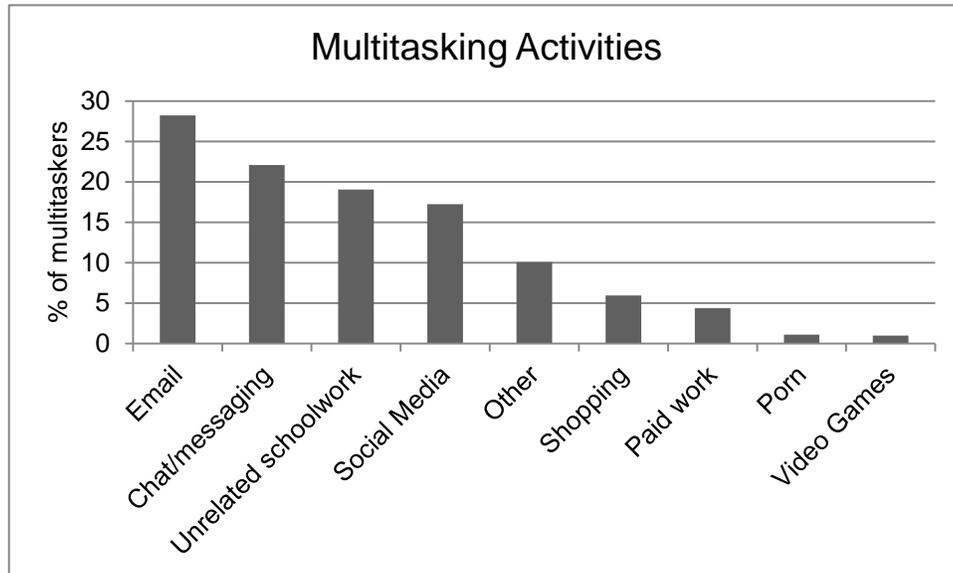
Figure 5. Multitasking activities.

One of the dynamics that phones and smart devices can affect is whether or not one's device can "request" one's attention—that is, it can be set to notify the owner when an email or other kind of message is received, with either a sound or a vibration, or both. Students were asked if they leave these notification settings on so that they are made aware of messages as soon as they are received in class: 67% (83) of multitaskers acknowledged doing so. Of these, 72% (60) reported following up immediately for "important messages only," and 19% (16) admitted to reading them only, and waiting until later to follow up. Only 8% (7) reported that they immediately follow up with all messages received.

Respondents were asked to consider their patterns of multitasking in the classroom. Fully 79% (98) indicated that they multitasked when they were uninterested in the class material. Slightly more than 68% (85) engaged in multitasking when they had other more pressing work to complete, and 60% (75) admitted to multitasking when they needed to "take a break" in order to refresh themselves. Roughly 58% (72) multitasked when they were expecting important communication, and 36% (45) engaged in other activities when they felt irritated by their

professor. Nearly one fifth (18% [22]) reported that multitasking helped them to absorb the

material better, that in fact the multitasking helped them to pay better attention in class. Thirteen

percent (16) wrote in other patterns of use. Four percent (5) indicated reasons that related to a

poor opinion of the professor or the course, for example: "When the material being covered is

unnecessary or not useful to perform well in the class," "When the class is boring or useless or

when the teacher does not teach well," and "This is an important subset of 'uninterested': when

professors are disorganized/late/repetitive I focus on other schoolwork or emails that need

attention. If they are not using my time well, they do not deserve my full attention."

A few students—3% (4)—indicated that they use class time to manage the rest of their

lives, for example: "There is too much work to do, and not enough time/energy to do it. When I

get home from class, I'm too tired to work, so I multitask in class." Another student responds to

work clients during their class time. A few respondents (2.5% [3]) gave some answer along the

lines of being irritated by their fellow student: "When I do not like other students and feel

irritated by them" and "When other students ask irrelevant questions that result in tangents that

can last for 15–20 minutes." See Figure 6 for a visual description of these results.
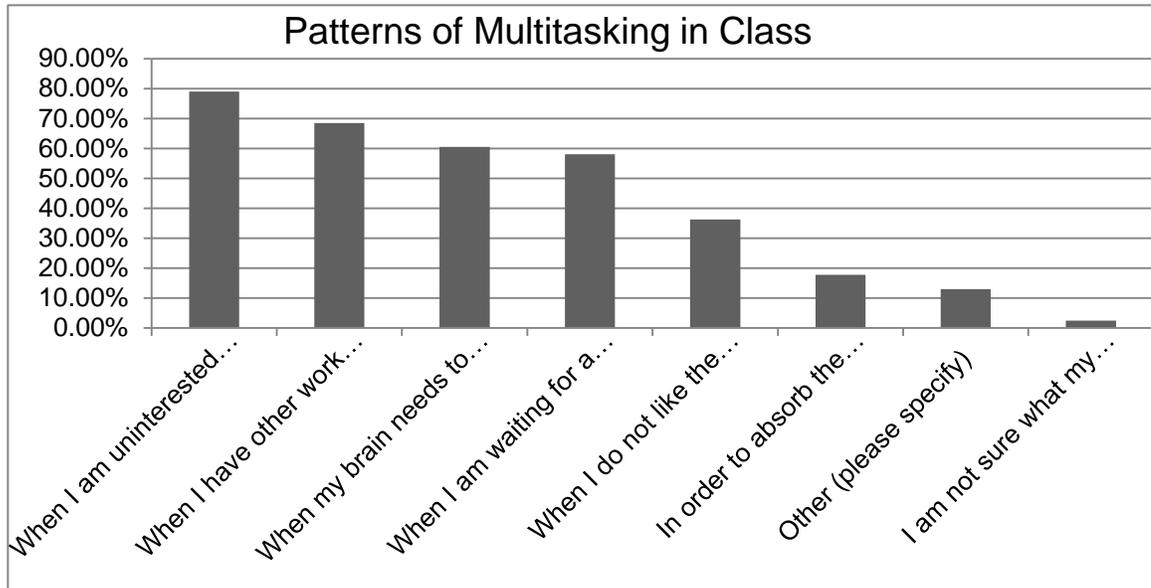
Figure 6. Patterns of Multitasking in Class.

Multitaskers were then asked how true two statements were for them on a scale of 0 (*Never True*) to 100 (*Completely True*). The first statement was "I only engage in non-class activities on my device when I believe the professor is unlikely to find out." The average response to this was 50% (*Sometimes True*). However, the range was 0–100, with a standard deviation of 26.26. The second statement was "I only engage in non-class activities on my device when I believe I am unlikely to offend others." The average response to this was 64%, between "Sometimes True" and "Completely True." This response also had a wide range, from 0–99, and a standard deviation of 25.85. So it would appear that concern about offending other students may be a slightly more powerful deterrent than the professor discovering the behavior, on average.

Next, multitaskers were asked about feelings of guilt regarding their behavior. There was again an enormous variation in responses, ranging from 0 (*Not at all guilty*) to 100 (*Extremely guilty*). The average response was close to the middle at 47%, leaning towards feeling less guilt than more. The median and the mode were both 50, and the standard deviation was 23.83.

A majority of multitaskers (68% [84]) acknowledged that they do feel at least some degree of concern if other students are aware of their multitasking behavior in the classroom. Of those who feel concern, the average level of concern fell at 42% between 0 (*A small amount*) and 100 (*Quite a lot*). The range of answers was 0–100, with a median of 46, a mode of 50 and a standard deviation of 22.48.

When asked to explain why they may feel concern if other students know about their multitasking, 75% (62) worry that the other students will think they don't care, 36% (30) worry about offending their fellow students, and 30% (25) are concerned about being viewed as unethical. 30% of respondents also added other reasons, a majority of which related to concern for their fellow student, for example: "I worry I will distract them" and "I worry I am interrupting their learning." Of the students who indicated worry about other students discovering their multitasking, 19% (16) expressed this concern regarding the potential for distracting their fellow student or interrupting their learning, and 8.5% (7) expressed some kind of concern around being judged negatively in some way, for example: "I worry about outing myself as neurodivergent" and "I worry they will think I am lazy."

Five questions asked students to rate their level of concern about a specific aspect of their multitasking, on a scale from 0 (*Not at all concerned*) to 100 (*Extremely concerned*). The first one asked about concern regarding multitasking in small discussion-based classes. The level of concern here averaged at 79.5%, as compared to the concern regarding multitasking in large, lecture-style classes, where the level of concern fell to 29%. There was a high degree of concern (75%) regarding the likelihood of professors having knowledge of their multitasking, and somewhat less concern regarding their potential loss in education (though still substantial at 61%). Students expressed concern at an average level of 50% (*Somewhat Concerned*) regarding

their feelings about multitasking in the context of how much they are spending on their

education.

Four questions invited students to rate the likelihood of certain situations to deter them

from multitasking on their devices, on a scale from 0 (*Highly Unlikely*) to 100 (*Highly Likely*).

The first question asked if the student would be likely to avoid multitasking if the school had an

official policy about it, with an average response of 55%. If the professor explicitly stated not to

do it, the average level of deterrence rose to 72%. If the student liked the professor and was

concerned about them feeling disrespected the average level of concern rose yet again to 82%.

An average concern of 71% was elicited if the student were to be made aware of research that

indicated that multitasking behavior might sabotage their ability to be an effective therapist in the

future.

A majority of multitasking students (59.5% [74]) reported that they believe they are able

to manage their multitasking behaviors fairly easily, refraining from the behavior when they feel

it is appropriate to do so. Slightly more than one fifth (22% [27]) reported attempting to refrain

but finding it difficult or impossible to do so. Thirteen percent (16) turn off their devices when

they seek to avoid being tempted, and 5.5% reported making no effort to monitor their usage.

See Figure 7 for a visual description of these results.
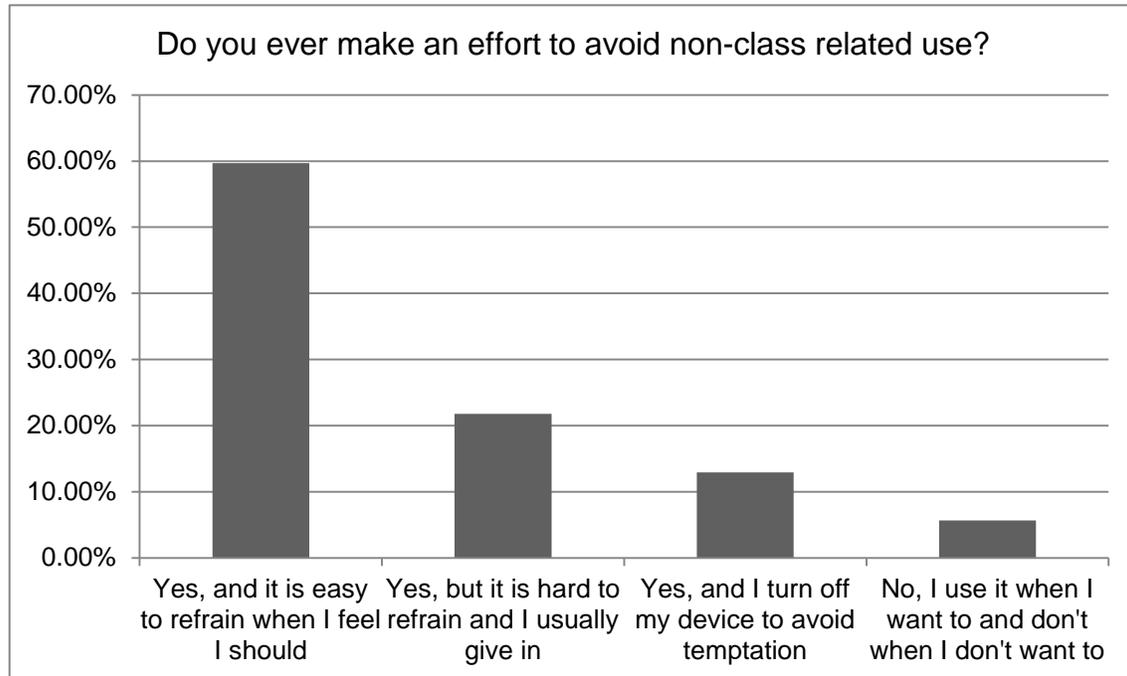
Figure 7. Do you ever make an effort to avoid non-class related use?

Nearly half of the multitaskers—49% (61)—believe that their multitasking behavior in the classroom has no impact on their ability to pay attention effectively with therapy clients. Approximately 27% (34) believe it may negatively impact this ability, while 22.5% (28) did not know. Less than one percent (1) of respondents indicated their belief that their multitasking behavior may enhance or positively impact their ability to pay attention effectively with their therapy clients.

Non-multitaskers. Students who had indicated in the first part of the survey that they never engaged in multitasking behavior in the classroom were asked for their reasons why they thought this was so, and were invited to offer multiple reasons. A large majority, 81% (17), reported that they wanted to gain the maximum benefit from their education; 57% (12) reported that they do not use a computer or a device in class, and 47.5% (10) reported that they were too interested in the information being presented. Some admitted that they were tempted, but 43% (9) did not want to risk offending the professor, 28.5% (6) did not want to disturb other students,

and 19% (4) were concerned about being judged by others. Roughly 33% (7) believe it is wrong

or unethical. Fourteen percent (3) reported that it had not occurred to them to multitask, and 5%

(1) gave their own reason as related to a sense of reciprocity with the professor: "If the professor

is engaged fully in teaching, why should I not be fully engaged in learning? It seems only fair

since the professor has to wait until after class to engage in other uses of computers/devices."

This would seem to fall into the ethics category listed above. See Figure 8 for a visual

representation of these particular results.
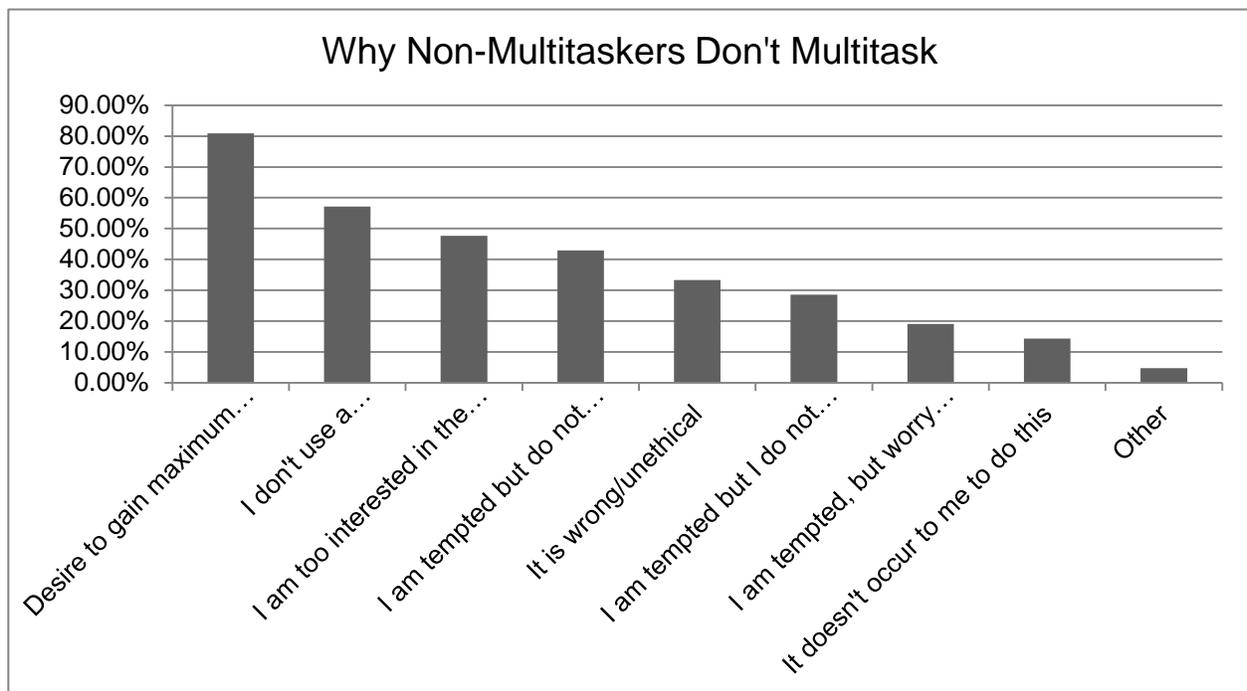
Figure 8. Why non-multitaskers don't multitask.

Results related to others' multitasking and multitasking in general. All respondents

were asked if they notice any of their fellow students engaging in non-class-related activities on

their computers or devices while in class, and if so, how they felt about it. Nearly all the

respondents (95% [138]) reported noticing when their fellow students multitask on their devices.

Those who indicated that they do notice this behavior were asked five questions related to their

opinion about it.

The first question asked how much it bothers them when they notice other students multitasking during class, on a scale ranging from 0 (*Not at all*) to 100 (*Extremely*). The average answer fell at 38.5%, on the lesser side of the central anchor (*Somewhat*). Next, students were asked how much it affects their opinion of the student who multitasks, on a scale of 0 (*Very negative opinion*) to 100 (*Very positive opinion*), with a central anchor at 50 (*Neutral*). The average answer was 43%, slightly negative of neutral. When asked how much it distracts them when they notice it, on a scale from 0 (*Not at all*) to 100 (*A lot*), with a central anchor at 50 (*Somewhat*), the average answer was 37%, on the lesser side of the center. Students were then asked about their likelihood of engaging in multitasking behavior after noticing a fellow student doing it; the average answer fell at 35% in between 0 (*Not at all*) and 50 (*Possibly/Sometimes*). Lastly, students were asked if the size of the class in which they noticed a student multitasking made a difference as to how they viewed the behavior, that is, if it matters less in larger classes, and more in smaller classes, for example. The average answer to this question fell right in the middle of the scale, at 50 (*Makes a slight difference*).

Students were asked if they had engaged in non-class-related activities on their computers while in undergraduate classes. Two fifths (56) of respondents replied that they did "occasionally." Another 23.5% (33) engaged in undergraduate multitasking "often," and 3.5% (5) did so "always." Approximately 18% (26) replied that they "never" did, and 15% (21) replied that there were no/few computers when they were an undergraduate.

Participants were then asked four questions related to their opinion on the potential impacts of classroom multitasking on education quality as well as relationships among students and with professors. The answers were on a scale of 0 (*Very strong negative impact*) to 100

(*Very strong positive impact*), with a central anchor of 50 (*Neutral/no impact*). When asked if

they believe multitasking impacts the quality of education of those who do it, the average answer

was 38%: in the negative zone but closer than not to neutral. When asked if they believe it

impacts the quality of education received by those sitting near multitaskers (but not engaged in it

themselves), the average answer was slightly closer to neutral at 40%. Respondents believe, on

average, that multitasking harms relationships with professors more seriously than it does among

students: for student/professor relationships the average answer was 32%, and for relationships

among students it rose closer to neutral at 45%.

Respondents were then asked if they find themselves engaging with the Internet when

they believe they should be doing other work, when not at school. "Often" was the most common

response, at 43% (62), followed by "sometimes" at 38.5% (56). Only 1.5% (2) answered "never"

and 17% (25) answered "much/most of the time." See Figure 9 for a visual representation of this

spread.
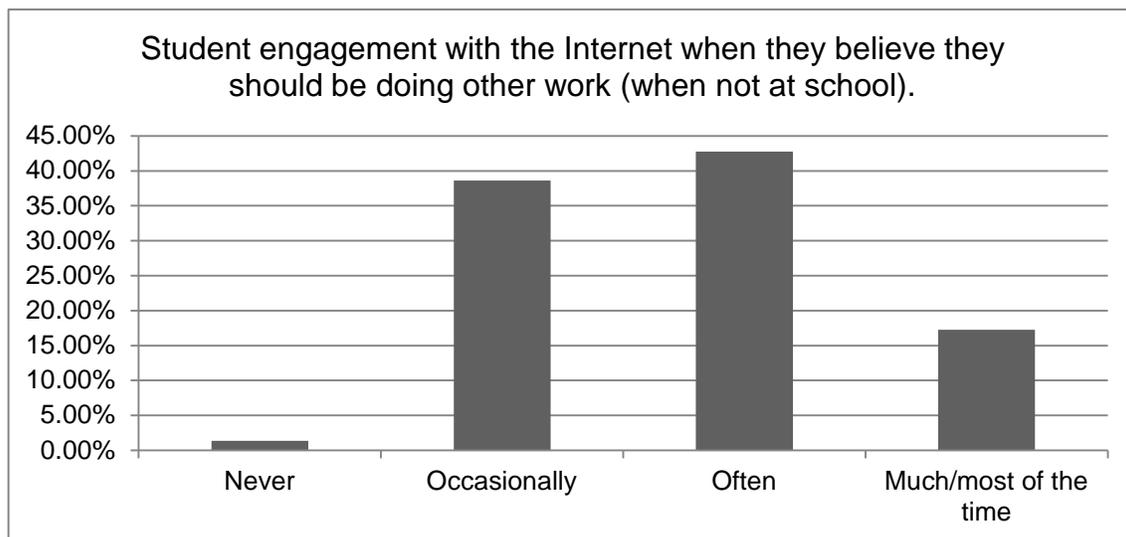
Figure 9. Student engagement with the Internet when they believe they should be doing

other work (when not at school).

When asked if anyone had ever told them they spend too much time on the Internet, 19% (27) responded in the affirmative. Respondents indicated that while they occasionally struggled with staying present in their lives, a majority answered "rarely" (37% [54]) or "sometimes" (29% [42]). One fifth of respondents (29) answered "often" and 1.5% answered "all the time," while 12.5% (18) answered "never." Nearly half of respondents (47.5% [69]) replied that they do engage in some kind of regular meditation practice.

When asked if they believed the issue of students multitasking in class is a problem that deserves attention, a majority answered that they did not think so (58.5% [85]). Finally, 23.5% (34) of respondents admitted to attending to something else in the midst of doing the survey, before being asked to share any thoughts they might have on the topic. The results of this final portion of the survey are explored in the qualitative analysis section below, following a quantitative analysis of the working hypotheses posited about the study.

Statistical Analysis of Working Hypotheses

In order to maximize the statistical power of the variable of age, respondents were grouped into three cohorts. The age ranges used were based on generations that have been referred to, albeit loosely, in the scholarly literature: Generation X is the name often applied to those born between the early 1960s and 1981 or 1982 (Masnick, 2012); "Generation Y," also the first to be called digital natives, can refer to people born between 1982 and 1991 (Oblinger & Oblinger, 2005) and "Generation Next" often describes those born after 1993 (JISC-Ciber, 2008). The ranges used were as follows: (a) younger than 26 years old, (b) 26–35 years old, and (c) older than 35. These roughly translate as Generation Next, Generation Y, and Generation X, respectively.

Additionally, it should be noted that in the previous review of the results of the survey, the amount of time spent multitasking was expressed in the context of students who reported multitasking to any degree. However, in the statistical analyses, data about multitasking time was taken from the entire sample, which added many datum points of "0" as 14.5% of the respondents reported never multitasking in class. This led to a lower average (17.45% of time spent multitasking vs. 20.5% for the group that included only multitaskers).

Is there a relationship between students' age and their level of multitasking behavior in the classroom? The first working hypothesis was that there is a negative correlation between age and multitasking behavior, assuming that younger students who are more likely to be digital natives will also be more likely to multitask while in the classroom. The null hypothesis in this case was that there is no relationship between age and the amount of multitasking behavior engaged in, in the classroom.

An ANOVA was conducted to examine the relationship between age and time spent multitasking, with age separated into three groups: (a) <26 years, (b) 26–35 years, and (c) >35 years. While not statistically significant, a slight potential relationship was found, but not one that corresponded to the working hypothesis. Rather it appears that the relationship may be expressed as a curvilinear trend, with the central age group of students possibly engaging in more multitasking behavior than either the youngest or oldest respondents, $F(2, 142) = 2.61$, $p = .077$. See Table 2 for the results of this test.

Is there a relationship between students' age and the degree to which they see multitasking as a problem? Another working hypothesis was that of those students who do engage in multitasking on the computer while in class, those who are younger may be more inured to it, and therefore may see it as less of an issue needing attention. The null hypothesis in

this case was that there is no relationship between age and the degree to which multitasking is believed to be a significant problem. An ANOVA was run to determine if a relationship exists. However no significant relationship was found, $F(2, 142) = 1.35$, $p = .262$.

Is there a relationship between the amount of time respondents spend browsing on the Internet in an unfocused manner outside the classroom, and the amount of time they spend multitasking in class? Another working hypothesis was that there is a positive correlation between how much time people spend outside of class browsing on the internet in an unfocused manner, and how much time they spend multitasking in class. The null hypothesis was that there is no relationship between the amount of time spent on the Internet in an undirected manner during the student's week, and how much time they spend multitasking on the computer in the classroom. A Pearson correlation, while not statistically significant, revealed a small positive trend, $r(143) = .14$, $p = .094$, lending mild credence to this hypothesis.

Is there a relationship between the amount of time respondents spend multitasking in class and their relationship to mindfulness in general? Two hypotheses proposed that there is a negative correlation between respondents' engagement with mindfulness and the amount of engagement with multitasking in the classroom. This hypothesis considered two aspects of mindfulness: (a) the respondents' subjective report of how difficult they find it to stay present in their life in general, and (b) whether or not they have a regular meditation or mindfulness practice. The working hypothesis therefore proposed that there is a negative relationship between both of these variables and the amount of classroom multitasking behavior. The null hypothesis stated that there is no relationship between the student's engagement in non-class-related activities on the computer while in class, and their ability to stay present in general as well as whether or not they have a mindfulness practice. Students were asked to rate their ability to stay

present when they need to or want to, on a Likert scale of 0 (*No problem staying present*) to 4

(*Constant difficulties with staying present*). A Pearson correlation was used to examine the

relationship with students' ratings of their ability to stay present, and no significance was found,

$r(143) = .10$, $p = .216$. A T-test was used to examine the relationship between multitasking time

and the presence or absence of a mindfulness practice, and no significance was found here either,

$t(143) = -.16$, $p = .876$.

Is there a relationship between the amount of time a student multitasks in the

classroom, and the degree to which they see this behavior as a problem? A sixth working

hypothesis stated that there is a negative relationship between how much a student multitasks on

their computer while in class, and the degree to which they believe classroom multitasking is a

serious problem that deserves attention. The null hypothesis stated that there is no relationship

between these two variables. A T-test revealed a significant negative relationship between these

variables: those students who do not see multitasking as an issue in need of addressing were

almost twice as likely to multitask on their computers while in class, $t(143) = 2.94$, $p = .004$. See

Table 3 for a fuller description of this analysis.

Is there a relationship between the age of the student and their level of

guilt/judgment regarding multitasking behavior? Two ANOVA tests were conducted to

explore these relationships. The first ANOVA, between age and level of guilt, revealed no

meaningful relationship, $F(2, 118) = .56$, $p = .57$. However, the second ANOVA performed did

reveal a significant positive relationship between the age of the respondent and their degree of

negative judgment towards others who multitask on their device while in class: the oldest cohort

of students held an opinion that was, on average, nearly 10% less favorable than the two younger

cohorts, $F(2, 135) = 3.11$, $p = .048$. See Table 4 for the results of this test.

Qualitative Analysis

        The results of the qualitative portion at the end of the survey were coded using the

method of thematic analysis as described by Braun and Clark (2006). This method is particularly

flexible as it can be used within a variety of theoretical frameworks and can be adapted to

various types of analysis. In the case of this particular study it is used to provide a rich thematic

description of the entire qualitative data set, in order to convey the most predominant themes of

the data, particularly when there is no specific hypothesis being addressed (Braun & Clarke,

2006). At the end of the survey, respondents were given the following optional directive: "Please

share any thoughts you have related to this topic" with no limit on the number of words possible.

The aim was to see if engaging with the topic of computer multitasking in class might bring to

the fore the respondent's most strongly held beliefs about the topic, which they might be inspired

to share in this brief, open-ended format. Approximately 32% (46) of respondents provided some

amount of comment in the space provided. A thematic analysis identified four main common

themes. The first two, and most commonly endorsed, were of a problematic nature (*It's not my

fault* and *I have strong concerns).* The second two were of a non-problematic nature (*There are

positive aspects* and *This is not important).*

        "It's not my fault" (34). The most common theme that respondents alluded to when

invited to share their thoughts related to why they and other students multitask, and generally

held a passive, other-oriented stance. The most frequent sub-theme here was "poor quality

education" (20). Respondents reported that they multitasked in classes that they found boring or

unengaging, for example: "I am more likely to engage in this behavior if the class is poorly

organized or [is taught by] a professor who reads their slides," and "Teaching styles impact

whether or not I use my computer in class for non-related stuff." Students also multitasked if

they feel the class is less relevant: "I think non-class related web surfing goes up drastically for classes that are less necessary for our work in the future…(people are more likely to not pay attention in social psychology than in psychopathology)." Other students blamed the lack of quality in general in their graduate programs (2): "…the reason I did not engage as much in non-class related activities on the computer in undergrad is that I felt the quality of education was higher," and "The education system needs some improvement, and teachers/professors often are uninventive with their lectures/teaching." Some respondents (4) noted that the length of time in classes often led to multitasking behavior. This is partly because the long hours erode their ability to pay attention: "It's very difficult to stay 100% focused in a 3 hour lecture, especially when this happens 4–7x/week. I feel tempted to take breaks." This is also a factor because they are not left with time or energy at the end of the day to attend to other matters, for example: "I am in class or clinic for most of my waking hours during the day…I have run out of energy and brain capacity by the end of the day and am ineffective at night. Therefore I multitask during class when the discussion has ceased to hold my interest, when I'm super worried about getting other tasks done…"

Interestingly, this same respondent then goes on to write: "However, there are classes where I *never* even take out my computer…during these classes, which are much more engaging and discussion based, I am fully present and not using any devices." This would seem to imply that she actually benefits from having classes that do not hold her interest, so that she can more easily multitask while her energy is still available. If she found all of her classes engaging—surely a goal of every Psy.D. program—one wonders how she would solve her time/energy management puzzle.

Another sub-theme that emerged was the desire for the school or faculty to formally create a policy to limit or prohibit multitasking behavior on devices while in class. There were three references in different narratives that made a plea for this, for example: "I appreciate classes where the professor makes a clear policy and even asks that students put away computers/devices during certain parts of class," and "I feel as though professors must take a stronger stance on this issue as it relates to the learning of other students." Several respondents (5) noted their belief that using computers to take notes was at the heart of the issue: "I personally prefer to handwrite my notes…I know most of my peers use computers, and a large proportion of them engage in non-class related activities. I rarely find myself distracted, but I know it affects their learning more" and "I think that the presence of electronics as note taking devices is the core of the problem." One respondent's comment seemed to epitomize an extreme feeling of helplessness around this issue: "I wish my laptop would not notify me of messages on social media or email, but I do not know how to turn it off."

"I have strong concerns" (22). There were many expressions of concern regarding the topic of multitasking in the narrative section of the survey. The majority of comments within this theme (11) related to a sense of this phenomenon being seriously problematic in some way: "I know a lot of students that struggle with this," "I know getting distracted and doing other things on your computer when the topic has gone dry is a problem," "It worries me that we will have incompetent clinicians if too many students spend their class time in this manner," and "I believe using your computer in class deters learning."

A number of respondents (9) expressed their belief that multitasking behavior is rude, distracting or disruptive in some way: "I see non-class related use of devices as a sign of disrespect to all members of the learning community," "It's highly disruptive to others and

shows a lack of professionalism and courtesy," and "It is extremely distracting when others use their devices for non-school work while in class."

"There are positive aspects" (17). In contrast, a number of respondents commented on the positive aspects that the presence of computers in the classroom can offer, both in spite of and also because of the enhanced ability to multitask on non-class related content.

Respondents who appreciated having their computers in class for non-multitasking reasons (4) listed note-taking and enhanced engagement with the subject as their reasons for doing so. For example, regarding note-taking: "Having a computer in class is helpful in that I can take better, readable notes," and "…taking notes typing is a HUGE part of my learning!" Respondents who appreciated the ability of the computer to enhance their learning further made the following comments: "I use my device often to research topics tangentially related to class material. I feel this helps reinforce and generalize the knowledge gained in class," "I can see power points a lot better if it is on my computer because I tend to sit at the back of the class," and "…in the classes that I'm really bored or the style of teaching isn't working for me…I research the topic in a more interesting way."

Many students (7) commented on the way that having a computer in class helps them to maximize their time within overly busy lives. This was previously alluded to, in the first theme discussed, when one respondent alluded to the benefits of having an unengaging class in order to use that time to attend to tasks they would be too tired to manage later in the day. Other respondents made the following comments: "I only use it when there's something extremely urgent happening, like a huge project that needs a final touch or something," "…because I am concerned about getting another assignment done," and "many of us have outside work (e.g., independent research, practicum responsibilities) that may distract us from class."

Three respondents commented that multitasking on their computers helps to alleviate anxiety: "I use the internet to alleviate the constant low-grade anxiety that is pervasive during school," "I multitask during class…when I'm emotionally dysregulated (overly anxious)," and "…I get on Pinterest so I don't literally fall asleep, become more anxious, or frustrated."

One more aspect of this theme that merits comment was touched on by only two respondents, but raises some important questions nonetheless. These students claim that multitasking on computers in class helps them to learn better. For example: "I typically perform better when multitasking than when doing only one thing." Another respondent, who identified as having inattentive-type ADHD, shared the following comment: "…a lot of teachers…also invalidate and minimize the experience of students that need to multitask by justifying their no media policies with data that says it distracts other students who don't need to multitask. It's already hard enough to learn in environments that are tailored to neurotypical students."

"This is not important" (7). The final theme identified related to a belief that this issue is not a problem and/or does not need to be attended to. While fewer respondents endorsed this view in some way (7), this was still a notable sentiment. Two respondents alluded to students compensating at home for multitasking time in the classroom: "…they are comfortable compensating for this behavior with individual studying effort, so I don't have a problem with it" and "If I have previous experience with a professor, and I do not learn as much from their teaching style, I am more likely to study class material on my own and deviate from the class material while in class." Other respondents (2) spoke about it being the problem of the students who do it: "While this is a definite issue, I do not think it is in need of attention, as it mostly impacts the individuals engaging in the behavior. If they are willing to diminish their education, there aren't many strategies that would likely be effective in reducing their behavior." Others (2)

alluded to a desire to be trusted as adult-learners who are paying for school: "[Teachers] should

trust that at the graduate level we understand and have care for our education and want to attend

to classes. We certainly pay enough." One respondent directly shared their sentiment that this

issue is not important: "This topic is frivolous."

      Other qualitative data. Some responses (8 total) did not fit into an identified larger

theme but are worthy of note nonetheless. Two respondents highlighted distinctions of device

use that the survey did not make. One distinction was that of laptop vs. smartphone use: "To me

there is a difference in the distraction that someone using their computer for something other

than class material than someone quickly using their cell phone. Computer screens are much

more distracting." Another distinction was the location of multitasking: "I think there is a

difference between laptop use in class versus trainings. I would never use my laptop during

trainings where we discuss patient work. I definitely view my peer in a negative manner when I

see them on their laptop doing non-related work during trainings." A couple of respondents

spoke to the "necessary evil" aspect of devices, for example: "I don't like the way I cling to my

device and wish it wasn't so necessary to have. However iPhones have become integrated into

our existence and livelihood. I enjoy their benefits but it's a very slippery slope between

enhancing your life and distracting you from your very life" and "I feel negatively affected by

my addiction to social media, but I also am torn about the benefits it has the potential to make in

society."

      Lastly, one respondent made a comment that echoed one of the hypotheses of this

study— that age is a factor in ease of engagement with multitasking—but looked at this more

systemically: "I think there is a lot of enabling that occurs for people as they work in class. I

think the attachment to technology in younger generations is a factor in faculty enabling the behavior."

Discussion

What can be inferred from the various and variable data collected by this study? Perhaps the simplest concrete takeaways are that the vast majority (85%) of Psy.D. students who participated in this survey readily admit to multitasking on their computers during class time, and more students surveyed than not (58.5%) believe this is not a problem that needs to be seriously addressed. Given the self-selecting nature of this study, these numbers are likely to be lower across the full population of current Psy.D. students in the U.S., for reasons that are considered in the section examining limitations of the study. Nonetheless, these percentages do suggest that a substantial amount of multitasking activity is occurring in Psy.D. classrooms by students who are not wholly concerned about the repercussions. Of course, whether this is truly a problem or not for the future of psychotherapy is a complex question that may not have a straightforward answer, and will require substantially more time to pass as current generations of students move past the beginning years of their careers as therapists. However, it does present as an acknowledged problem for 41.5% of the respondents surveyed, which is a large enough percentage to be taken seriously now (even without all the data that predict poorer academic outcomes), and not at some future time when more data has been amassed.

Scope of Computer Use and Multitasking

It appears that, on average, students who responded are spending approximately six hours per day on their computers, roughly split down the middle with half of that time spent in a focused, directed manner, and half of the time browsing or "surfing." To a digital immigrant, this daily amount of computer/online use might seem difficult to accept; however this number is not

far off from the most recent figure surveyed by the Kaiser Family Foundation, describing the number of hours per day spent by 8-18 year-olds engaged with digital media in some capacity as 7.5 (Rideout, Foehr, & Roberts, 2010). The deeper question here asks what exactly qualifies as Internet addiction—for it is this syndrome that has been most definitively linked to poorer academic outcomes. This is a question beyond the scope of this study, but in the future it would be interesting to determine how widespread true Internet addiction is among students of clinical psychology.

It would seem that of those respondents who do multitask in the classroom, the average amount they do so is approximately 20% of the time, and this is predominantly when the student feels the professor has a teaching style that is boring, confusing, or simply "doesn't work." It is notable that the largest group of students (48% of respondents) described themselves as multitasking only "a little bit, in one or a few classes." However, this "little bit" averages out to one-fifth of class time. One might argue that 20% is not such a little bit, and yet when one looks at the average amount of time a student claims to spend on the computer every day (perhaps 30%–50% of their waking hours), then this percentage is put into perspective. To today's digital natives, spending 20% of one's time online is indeed not so much.

Online Activities and Deterrents

The top three activities in which respondents admitted to engaging while multitasking are email, messaging, and unrelated schoolwork. This implies that these students are either seeking interpersonal connections and/or maximizing their time by doing work or actively attending to matters outside of school. Fewer respondents are engaged in passive consumption of entertainment and social media during class time. This likely speaks to a number of possible factors: the level of connectivity that recent technological advances are training us to expect, an

increase in activity levels and overall "busyness" of the culture, and, perhaps, a decrease in both time management skills and the ability to delay gratification. With approximately 92% of Americans owning cell phones (Anderson, 2015), the expectation that communication can and should happen on demand is becoming widespread. Fully two-thirds of those surveyed keep their devices set to notify them immediately when someone who is not present in the room is trying to reach them, via phone call, email or text/chat message. Most of these students only follow up if they deem the message "important," but of course engaging in that decision-making still qualifies as multitasking, or a distraction from the class at hand.

However, many respondents (58.5%) reported that they don't view these distractions as problematic. They have increasingly become business-as-usual to those who have habituated to being instantly and constantly connected to others who expect to be able to reach them almost as soon as they like. Like the changing weather patterns outside the classroom window, student accessibility to other people or tasks that are not present has become a kind of background noise to which more and more people are becoming acclimated. Knowing that the professor may find out is only a mild deterrent for most, and while some respondents admit to experiencing some level of guilt about their multitasking behavior, just as many report feeling no qualms whatsoever.

What does seem to act as a stronger deterrent is if the student believes the professor is likely to feel disrespected by their multitasking behavior. This implies that many respondents might think that some professors are not bothered by their multitasking behaviors, which may well be true, although this would require a different study to determine. One student did in fact voice this question in the qualitative portion of the survey: "I'm curious if there is a counter survey to faculty re: their perception of the importance of engagement, what that means to them,

and whether or not they a[re a] licensed and active therapist."

Students surveyed also admitted to being concerned, to some degree, about the judgments of other students, more so than those of professors. Respondents shared that they want to be seen by others to be caring about the class, a perspective that they felt was at odds with their multitasking behavior, although this was a more important sentiment in the context of a smaller, discussion-based class than in a lecture environment. This sentiment seems to go hand-in-hand with the fact that a smaller class will tend to demand more of each participant, thereby offering more opportunities for stimulation and engagement with others in the class, and so potentially decreasing the pull to meet those needs by engaging elsewhere online. The social loafing theory discussed in the introduction is also a plausible reason behind greater care about not being seen to multitask in smaller classes than larger.

Impacts of Multitasking and Vulnerability Factors

Nearly two-thirds of those surveyed believe that engaging in multitasking has no impact on their ability to pay attention to their therapy clients. A further iteration of this study might be able to explore whether or not a relationship exists between the amount of computer multitasking in which a future psychologist engages, and their ability to hold their attention for a substantial period of time. However, that was beyond the scope of this study and I can do no more than speculate about how true this majority belief is. According to research shared in the introduction to this study, engaging in computer multitasking does tend to train the brain to search for increasingly frequent shifts in stimuli. But, as many of the students noted in both the quantitative and qualitative portions of this study, context is everything. In the words of one respondent, "I multitask during class when the discussion has ceased to hold my interest…However, there are classes where I *never* even take out my computer, let alone use it. During these classes, which

are much more engaging and discussion-based, I am fully present…" Respondents do seem to be able to control their multitasking behaviors to some extent, depending on the kind of classroom environment in which they find themselves. This would imply that students may be more resilient than expected, and more capable of retaining the ability to engage in System 2 thinking when they choose.

However, one concern this contextual factor raises is in regard to the nature of the psychotherapy or supervision delivered by the psychotherapist who multitasks on computers and devices, which is likely to be an increasing majority of clinicians as time goes by. It may be easier to hold one's attention when doing brief, solution-focused therapies where the therapist is motivated by both orientation and insurance companies to produce measurable change in a handful of sessions. It may also be easier to stay present for the clinician who naturally has a highly interactive style, who is drawn to offering dynamic interventions in therapy or supervision with a large degree of give and take, no matter the modality. In these cases, the practitioner is being much more directive, interactive, and actively offering interventions, which will help to deflect any pulls to wander inwardly. The assessment process as well is likely to be a less vulnerable context no matter what the personal interactive style of the clinician, due to the generally dynamic and highly focused nature of most testing measures. On the other hand, practitioners who are drawn to a therapeutic process that allows the client to speak for long periods of time may be more vulnerable to the shifting attention spans of a newer generation of clinicians. Long-term relationships with a greater focus on creating ample space for the client to share at length, particularly when framed to encourage the client to relax into a sense of expansive safety in order to allow the deeper currents of their psyche to emerge, may well struggle to get off the ground. For reasons explored earlier—facility with attunement, trust, and

empathic listening—these characteristics of depth psychology are more likely to be negatively

affected by the re-shaping of our focusing abilities from our technological interactions. However,

common factors theory describes rapport as a significant contributor in the success of all

theoretical orientations, and so this issue is still relevant across modalities.

Working Hypotheses

Of the eight working hypotheses presented at the start of this study, only two were found

to have statistical significance, and two others were found to have potential as trends. Perhaps

the lesser surprise of these two trends was the potential relationship found between the amount of

time spent multitasking in class, and the amount of time spent on the computer in an unfocused

manner while at home. That is, the more time a respondent spent browsing or surfing online

while at home, the more they might be likely to multitask while in the classroom. The

neuroplasticity of the brain, as touched upon earlier, gives a straightforward explanation for this

kind of potential relationship: the more we engage in a certain kind of behavior, the more we

tend to be drawn to repeat that behavior in other contexts.

What is somewhat less straightforward is the potential relationship between age and

amount of time spent multitasking, as this analysis resulted in a curvilinear trend, and not the

straightforward negative relationship that was expected. Students belonging to the cohort in the

middle—from 26 to 35 years of age (roughly correlating to Generation Y, or the generation first

called digital natives)—may be more likely to spend greater amounts of time multitasking in the

classroom than both older and younger students. As the results were only suggestive and not

definitively significant, they merit only a brief speculation as to why this might be. It is possible

that the first generation to be exposed to digital platforms from early childhood did so without

the benefit of an awareness of a need for caution or controls on the part of parents or schools. It

may be that younger generations have been impacted by the culture's evolution of a more mature

relationship to technology and that this may have imbued their early environments with greater

oversight, leading to better self-control regarding the compulsive nature of device engagement,

albeit marginally so.

Two hypotheses were found to be substantiated by this study. First, there was a negative

relationship found between the amount of time spent multitasking and the degree to which

multitasking is seen to be a problem: those who do not believe this issue is a true problem were

likely to multitask nearly twice as often as those who believe it to be a problem. Therefore it

would seem that harboring a concern about the behavior at a systemic level may act as a (slight)

deterrent for the behavior.

The second hypothesis that was confirmed was that of age having a positive correlation to

the amount of judgment harbored towards others who multitask. Those respondents who learned

to engage with computers at a later age—a.k.a. digital immigrants—are likely to be more

consciously aware of their use, by themselves and by others. They spent their youth in schools

that utilized teaching styles similar to those used today, but without the backdrop of technology

to shape their expectations and behaviors. Digital immigrants spent their early school years in

environments where student-generated distractions in the classroom would have been much more

noticeable and more easily frowned upon, unlike the surreptitious, digital "note-passing" of

today. It is curious, however, that a similar correlation between multitasking and feelings of guilt

was not found. Perhaps there is a more complex relationship at work here, whereby once a

student begins to engage in multitasking behaviors, they may be more inclined to enact defensive

processes that absolve them from the discomfort guilt would provide, and allow them to justify

their behavior as necessary to complete projects, manage a busy schedule, or allay anxiety or

boredom. Additionally, there was no correlation found between age and the degree to which multitasking is seen as a widespread problem. There are likely more factors at play here as well: older students may have a different kind of engagement with academia, having been away from school for some time and re-engaging later in life with different experiences and perspectives that do not necessarily lend themselves to focusing on systemic awareness and concerns.

The two mindfulness-related hypotheses were also unsubstantiated by this study: there was no relationship found between students who claimed to have a meditation or mindfulness practice and the amount of multitasking in which they engaged. There was also no correlation between their subjective description of their ability to stay present in their life in general, and the amount of multitasking they did in the classroom. This is clearly a much more complex and multi-faceted topic, not able to be addressed by brief and highly subjective questions toward the end of an online survey. There is too much room for error in self-description, and too many interpretations of the term "mindfulness practice" for this particular aspect of the study to have had much validity, one of the drawbacks of the design of this study. However, this lack of finding may also speak to the potential for a greater ability on the part of students to be able to engage in System 2-type attention when they choose, regardless of their engagement in mindfulness practice.

Qualitative Data

The qualitative data did not result in any surprising findings, but they do underscore the general direction towards which the study results seemed to be heading: although quantitatively more students feel multitasking is not a seriously concerning issue (58.5%), nonetheless many students do notice this behavior in the classroom and are affected by it to some degree, often negatively. However it is a complex issue that is intertwined with positive attributes, which make

it difficult to speak simply about the nature of the phenomenon and any potential responses that might be merited.

Potential Responses to Classroom Multitasking

Complexity aside, this study found that a majority of Psy.D. students studied are multitasking on their computers and devices in the classroom. Based on the current research that links multitasking in class with poorer academic outcomes, and potentially reduced capacity for effective and therapeutic relationship building, some response seems warranted to attempt to mitigate this behavior responsibly, even if a slim majority of those surveyed do not believe this problem merits much attention. Given recent thinking about 18–25 year olds constituting a new developmental cohort of emerging adulthood (Arnett, 2000), with implications for a greater need for guidance and holding than in previous generations, there may be compelling reasons for professors to integrate stronger articulations of their preferences regarding computer and Internet use in their classroom. Despite one student's clear language in the qualitative section asking that professors "trust that at the graduate level we understand and have care for our education," other students expressed a desire for greater involvement on the part of professors, essentially asking for policy to be created and/or enforced regarding this behavior that many readily admit can be addictive and problematic.

One question that was regrettably not included on the survey was whether or not students' schools have some kind of explicit policy around computer us in the classroom. It would be interesting to see if the existence and enforcement of policy is related to students' levels of multitasking in the classroom. However, given the widespread nature of this phenomenon, and the levels of concerns regarding the potential for multitasking behavior to offend professors and erode respect among students, not to mention all the other concerns

previously explored, it might be wise for the topic of multitasking to be a regular conversation in every class at the beginning of each semester, and perhaps throughout. It's no longer possible to pretend that this behavior is not happening, or to turn a blind eye to it because it's easier to ignore it than to take it on. This stance on the part of professors and institutions could well be considered irresponsible at this point, given all that we know. Many students are strongly compelled to multitask in their classes; they will be well-served to be able to have an open and honest conversation with their professors, as well as their fellow classmates, to determine the best way to co-author an academic environment that is effective in its ability to transmit learning as well as to respond to changing needs around stimulation and digital engagement. Knowing where the professor stands on this issue should also help to put students at ease regarding treating their professors with respect.

The creation and enforcement of policy should also take into account the changing nature of student needs for increased levels of stimulation. For example, some respondents complained about long classes in which their attention is naturally eroded over time. Allowing several ten-minute breaks, even if the class must be scheduled to last a bit longer, would acknowledge the reality that students are increasingly compelled to attend to communications as they arise in the moment. To label such breaks as "email oases," or some such term, would make it more explicit that the rest of the time is not meant for digital engagement, unless integrated into the curriculum. The students surveyed indicated a need for more accountability as well as more capacity to respond to important communications; such a policy would allow for both.

Other recommendations that would seem to follow naturally from the results of this study are not new in terms of trying to improve academic environments: smaller class sizes and more interactive, experiential approaches to learning are generally seen as an improvement over older

models of large classrooms where the professor stands at the head of the room and lectures in a

one-way monologue for the extent of the class. Respondents were very clear in their assessment

that they multitasked much less or not at all in smaller classes, and also when the professor had a

more engaging and creative teaching style.

Given these preferences, in tandem with the changing neurological profile of students to

greater engagement with System 1 thinking, it is important to ask more probing questions. Is the

quality of teaching truly at poorer-than-ideal levels, and only the exceptional teachers manage to

hold the attention of their students? Or are students becoming acclimated to a kind of

environment that is increasingly out-of-step with the way academics have traditionally been

delivered, even with recent advances in pedagogy? The terms "neurotypical" and

"neurodivergent" were used casually in participants' responses to this study, which supports the

notion that students are undergoing a rapid evolution in their methods of engagement with the

world due at least in part to internet-related technology—so much so that these terms are

becoming part of the standard vocabulary. The rate and magnitude of these changes to cortical

functioning have likely not been seen before, and while they may eventually be modified as our

understanding of these changes evolve, they are unlikely to be reversed. Most survey participants

indicated that knowledge of evidence that multitasking in the classroom could sabotage their

ability to pay attention in the therapy room would probably be a strong deterrent to the behavior;

nevertheless, despite being primed by this question in the middle of the survey, a majority later

indicated their belief that this phenomenon is not problematic. It would seem to have become too

interwoven into the fabric of life to see it as a behavior that might need serious reshaping or even

extinguishing—a response that would likely be ineffective anyway given the nature of its

momentum.

Therefore, while some measure of policy enactment may be called for on the part of

professors and school administrations—as some students alluded to in their commentary at the

end of the survey—it would be foolish to think that policy alone or a few minor structural

changes could be an adequate response to this issue. The respondent who accused professors of

"enabling the behavior" of multitasking, due to the younger generation's attachment to

technology, was probably correct in their identification of one of the reasons why professors may

overlook multitasking or unwittingly support it in their teaching methods (e.g., PowerPoint

presentations that students may "follow" on their own devices). But instead of terming it

"enabling," it might be wise to consider it to be an attempt at adaptation, albeit one that might

need more thoughtful design.

Adapting to the times, such as they are, may be the most helpful recommendation that

this study might offer. This approach is certainly not new, and much of academia has been

grappling with the implications of the rise in computer use and the Internet for as long as they

have been around. Eleven years ago, N.K. Hayles of UCLA wrote about the movement from

deep to hyper attention styles in her students, with the notion of deep and hyper attention

corresponding to the System 2 and 1 modes of dual-cognition theory, respectively. According to

Hayles (2007), "…we are in the midst of a generational shift in cognitive styles that poses

challenges to education at all levels…we need to become aware of the shift, understand its

causes, and think creatively and innovatively about new educational strategies appropriate to the

coming changes" (p. 187). Hayles, one of the leading proponents of the need for academia to

adjust to the increasing presence of the hyper-attentive styles of current students, speaks further

to the urgency of such a need:

So standard has deep attention become in educational settings that it is the de facto norm,

with hyper attention regarded as defective behavior that scarcely qualifies as a cognitive

mode at all. This situation would present no problem if no generational shift from deep to

hyper attention were taking place. But with the shift, serious incompatibilities arise

between the expectations of educators, who are trained in deep attention and saturated

with assumptions about its inherent superiority, and the preferred cognitive mode of

young people, who squirm in the procrustean beds outfitted for them by their elders.

(p. 188)

This study's primary aim was simply to paint a picture of the experiences, behaviors and

beliefs of students currently enrolled in clinical psychology programs in the US regarding their

relationship to computer multitasking in the classroom. However, a deeper understanding of the

phenomenon of classroom multitasking from students' points of view may invite the creation of

a more elegant response to this generational shift within academia than simply forbidding or

shaping behaviors in which students, like it or not, are substantially engaged for a vast portion of

their waking hours.

The development of truly new pedagogical responses to this phenomenon that would be

effective within a curriculum of clinical psychology is a project beyond the scope of this study;

however it may be helpful to mention a few solutions found in some laboratories that have been

met with at least a moderately positive reception. The University of Southern California is one

such site of pedagogical exploration, as it sponsors research in classroom models that offer

students the levels and types of stimulation to which they are increasingly accustomed, while

attempting not to compromise the quality of their education. One model includes a process

known as backchanneling. Classrooms are outfitted with large screens to which all members of

the classroom have digital access via their laptop computers; students who are not actively

participating in the classroom discussion can type a contribution onto the larger screen so that it

may be added to the conversation via a different channel, so to speak. Aside from their thoughts,

students can offer links to outside resources that may enhance other students' learning, whether

they follow-up in that moment or at a later time. However, this methodology requires the

facilitation of a professor who is as comfortable with multitasking as the students are, and who is

open to the traditional hierarchies of the classroom being challenged (Losh, 2009).

Another experimental model that is somewhat similar to backchanneling is called

"Google Jockeying" by its creators at USC (Hayles, 2007, p. 196). This takes place in the same

screen-outfitted classroom, but in this instance students can search the web for relevant content

that will supplement the material being taught either through images, examples, or even through

providing contradictory views, all in real time.

These models of teaching require a shift in philosophy that allows the classroom in

general to be more attuned to the kind of environment that today's students are both seeking and

inadvertently creating. Another possible model that might be tailored more to an applied

psychological curriculum could include real-time "interactions" with virtual therapy clients,

whether they are flat-screen computer-generated imagery or as holograms. Probably better suited

to the learning of brief, manualized cognitive/behavioral therapies than attachment-based

modalities, nevertheless this kind of interactive classroom would offer a heightened experience

of engagement with technology that is increasingly attractive to students which would still be

relevant to the curriculum. This kind of experience would provide the heightened sensory inputs

that more students seem to be craving, while keeping those inputs focused on material related to

the curriculum.

As an older student with a bias toward depth psychology, I admit that the idea of

interacting with a computerized version of a client imbued with artificial intelligence is

somewhat off-putting. I also struggle to imagine how the field of psychotherapy could not suffer

if students are offered more, not fewer, streams of stimulation within the classroom. But my own

lack of imagination as a digital immigrant is irrelevant in the face of what appears to be

increasingly convincing evidence that students are engaging differently in the classroom and in

the world, whether we judge it good or ill. Therefore, I believe that in addition to having frequent

and open conversations about multitasking policies, it is worth exploring outside the boundaries

of traditional modes of learning in order to find new ways to respond with greater effectiveness.

Hayles (2007) writes, in response to this generational shift: "[a]s students move deeper into the

mode of hyper attention, educators face a choice: change the students to fit the educational

environment or change that environment to fit the students" (p. 195).

Studies of multitasking have been more often forged from within a traditionally

reductionist lens—as this study was, originally—as researchers test out their hypotheses that

successfully link the behavior with poorer academic outcomes and reduced empathy. The studies

are then generally presented as a cautionary tale to those who fail to regulate multitasking

behavior—a story told in tandem with a belief in the superiority of deep attention. However, this

study of student behavior and beliefs invites us to consider that the issue may be more complex

than this, and deserving of responses that are borne of a different paradigm. Academic

laboratories that are exploring new ways to respond to the evolution of student attention

acknowledge that they may be creating new pedagogies that "not only trouble the assigned

hierarchical roles of the classroom situation but also disrupt norms about disciplinarity that

institutions may hold dear" (Losh, 2009, Introduction). It may be a disconcerting road ahead as

traditional views of education are challenged and new styles of teaching that integrate virtual

reality become more sought after by students. It may also be worth remembering that while students of clinical psychology are evolving to value System 1 (hyper) attention as much as System 2 (deep), the values and inclinations of their therapy clients are evolving right alongside them. It is too early to know what this might mean for the future of psychotherapy, but graduate programs might do well to begin considering innovative responses to this evolution in attention, by seeking and integrating the feedback and expertise of those same students whom they seek to train.

Limitations and Future Research

There were a number of limitations of this study that precluded the capture of a fuller picture of the phenomenon it aimed to explore. The timing of the release of the study was not ideal, as program directors were contacted shortly after the New Year holiday. Many of them were either still on holiday or in the midst of the start of a new semester, or imminently heading to the NCSPP conference also scheduled for this time period. Additionally, sending out the survey before so many programs had started their semester classes rendered moot the question that asked if students were taking the survey during class.

The design of the survey itself was also problematic. Several questions had overlapping domains, which likely contributed confusion to the respondents' experience. Many questions relied on highly subjective speculation on the part of the students: (a) how much time they browsed the internet at home, (b) the percentage of time they multitasked across all their classes, and (c) how much of that time they devote to specifically identified activities, for example. Future studies would do better to find students willing to install tracking programs on their computers or devices in order to maximize the accuracy of such data. If these students could then be tested for their abilities in maintaining System 2 attention, a truly valid relationship could be

sought between multitasking behavior and mindfulness; if found, this could provide substantial evidence of a negative correlation between classroom multitasking and the ability to stay present in the therapy room.

The Survey Monkey platform also had some problematic aspects to its design. For example the slider tools that measured students' answers on a scale from 0–100 had places for only three anchors: at both ends of the extreme and then exactly in the middle. Many of these slider questions resulted in a mean and/or mode of 50 considerably more frequently than would be statistically expected with a standard distribution. Having only three anchors likely diluted the level of nuance that would have been captured with more descriptive labels placed along the spectrum. There were also some questions where adding a description to an "other" answer was not possible, leading to a loss of nuanced understanding as to what other activities students were engaged in when they multitask, for example.

It is important to address the self-selecting nature of this study and to consider how this may have impacted the data collected. In truth, students who are drawn to spend 15–25 minutes answering an online survey about their relationship to computers are already likely to be more comfortable using computers; this must necessarily affect the outcome of the study. Students who are very uncomfortable with computers are probably either multitasking less or not at all in their classes, and these students would be much less likely to participate in a computer-based survey. Alternatively, a student may be comfortable with computers in general and might be highly distractible, but may not be able to afford a computer with the kind of high-speed abilities that facilitate multitasking in class, or that make it less-than-torturous to engage with an online survey. Therefore it is highly likely that these results are not an accurate representation of all students in the US who are currently enrolled in Psy.D. programs.

Although it may not qualify as a limitation, it seems worthy to re-state the fact that this study was originally conceived of within a more traditional, modernist lens, which the results both highlighted and challenged. My interest in this study was borne out of my own surprise—and judgment—regarding students around me who casually multitasked on their computers during our graduate classes, something I had never experienced as an undergraduate 20 years prior. This judgment was inevitably reflected in the survey design; fortunately and in spite of this bias, the data collected was still able to point a finger at the need to consider looking at this phenomenon from a post-modern paradigm. While it's true that there is solid evidence that supports the hypothesis that classroom multitasking (in currently constructed classrooms) results in poorer academic outcomes for both the multitasker and their neighbor, it may be that this evidence should be turning our attention toward the context of the behavior as much as we have been focusing on the behavior itself. With that in mind, future studies relating to multitasking might offer more useable outcomes were they to focus on exploring new kinds of pedagogy that take into account this undeniable shift from deep to hyper attention. For while it may not be helpful to simply outlaw behavior that students are going to engage in anyway, it is probably just as unhelpful to accommodate multitasking by simply accepting it without any adaptation. As seen from the results of this study, students are still unhappy with much of their education and now simply have one more tool with which to manage their frustration. Better to seek new methods of teaching that not only acknowledge students' growing need for increased connection and stimulation through multiple channels, but also harness these needs. Research that could integrate these inclinations into creating a dynamic experience of a clinical psychology curriculum that would enhance learning is a valuable and, I believe, a necessary response to these subtle but potent changes in the neurological landscape of new and emerging practitioners.

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Appendix A: Survey

You must be a full-time student taking classes currently to qualify for this study – students who have moved on to the internship stage of their program (or beyond) are not eligible to participate.

Are you a doctoral student in clinical psychology who is currently enrolled full-time in your program, including coursework, who attends at least 75% of your classes in person?
        ____Yes ____No

(If yes, continue to survey. If no, exit to page that states that the respondent is not qualified for the study)

Preliminary Demographic Information

(1) In what year were you born? _____

(2) a) Did you grow up interacting with computers from early childhood (i.e., from before the age of 10)? _____Yes _____No

   b) If no, about how old were you when you began using computers regularly?   _____

(3) a) Do you identify as having a diagnosis of ADHD (any type)
        _____Yes   _____No

   b) If yes, is it: _____Hyperactive type _____Inattentive type
   _____ Both hyperactive/inattentive type   ____ Don't know

(4) How comfortable (i.e., fluent) are you using computers? ___Completely comfortable
   ___Mostly comfortable ___Sometimes comfortable, sometimes not
   ___ Mostly uncomfortable ___ Very uncomfortable

(5) How much time do you spend in a focused, directed manner on your computer when NOT in class, on an average day (e.g., completing work or homework assignments, responding to emails, not "surfing")? Please estimate in hours per day using numerals only. (decimals okay)

              _____.__hrs/day

(6) How much time do you spend in an unfocused, non-directed manner on the internet, on an average day (exploring, surfing, on computer or smart device)? Please estimate in hours per day using numerals only. (decimals okay)

              _____.__hrs/day

(7) Are you currently taking this survey while in class? ___Yes ___No

(8) While in class, do you ever engage in activities on your computer/device that are unrelated to the content of the class you are in? (Answer "yes" even if it is only rarely) (NOTE: This question pertains to classes you take in-person, not online)
_____Yes _____No, never

If Yes → *go to Question 9 (Reflections on subject's non-class related use)*
If No → *go to Question 22 (Why the subject never engages in non-class device use)*

Reflections on subject's non-class related use:

(9) What type of device do you use **most** during class (for any reason) (check only one)?
____ Computer/laptop
____ Tablet/iPad
____ SmartPhone
____ Other (please specify)

(10) What percent of the time do you engage in non-class related activities on your device? (Please provide a whole number that is an estimate generalized across all your classes)____**%**

(11) When do you engage in non-class related activities on your device, while in class (check all that apply)?
_____ A little bit in only one or a few classes
_____ A little bit in most or all of my classes
_____ A lot but mainly in one or a few classes
_____ A lot in most or all of my classes
_____ Mainly in larger, lecture-style classes
_____ Mainly when the professor has a style that doesn't work for me (e.g., boring, confusing)
_____ Only when I am expecting an important email/message/phone call
_____ Other (please specify):

(12) When you do engage in non-class-related work, roughly what percent of the time do you engage in the following activities? (Your answers should add up to 100)

_____% Social media (Facebook, Twitter)
_____% Email
_____% Chat/Messaging
_____% Video Games
_____% Shopping
_____% Porn
_____% Paid work
_____% Unrelated schoolwork
_____% Other

(13) a) Do you have your device set for notifications of emails and other messages to come in automatically (so you don't have to actively check)? _____Yes _____No

    b) If yes:
        Do you immediately follow up on emails that seem important?
        _____ Yes, all messages
        _____ Sometimes – only important messages
        _____ No, I may read them but wait till later to respond

(14) When you do engage in non-class related activities on your device in the classroom, how much of it is it in the following situations (please check all that apply):

    _____ When I am uninterested in the class material

    _____When my brain needs to take a break in order to refresh

    _____ In order to absorb the material better (it helps me to pay attention better if I   have other tasks going on)

    _____When I do not like the professor and feel irritated by them

    _____When I have other work to complete that feels more important than the class

    _____When I am waiting for a specific message/email

    _____ Other reason not listed

    _____ I am not sure what my pattern of use is/don't know why or when I do it

(15) How true is this for you: I only engage in non-class activities on my device when…

  a)…I believe the professor is unlikely to find out
  Completely true ------ Sometimes true ------- Never true *(slider answer)*

  b)…I believe I am unlikely to offend others (e.g., in a large lecture class)
  Completely true ------ Sometimes true ------- Never true *(slider answer)*

(16) How do you feel in general about your non-class related device use during class?
        Not at all guilty------ Slightly guilty------Extremely guilty *(slider answer)*

(17) a) Does it concern you if other students are aware of your non-class related use while in class?

        ___Yes (even if slightly)
        ___ No *(If no, survey skips to question 18)*

b) If yes:

How much does it concern you if other students know about it?
Only a small amount/rarely ------ Somewhat ------Quite a lot *(slider answer)*

c) What are some of the reasons why it concerns you if other students know? Please check all that apply.

I worry that I will offend them _____
I worry they will think I don't care _____
I worry they will think I am unethical _____
Other (please specify):

(18) How much do the following factors affect how you feel about your non-class related device use:

(a) If I do it in small discussion-based classes:
Not at all concerned-----Somewhat concerned------Extremely concerned
(slider answer)

(b) If I do it in large lecture-style classes:
Not at all concerned-----Somewhat concerned------Extremely concerned
(slider answer)

(c) If the professor is likely to be aware of it:
Not at all concerned-----Somewhat concerned------Extremely concerned
(slider answer)

(d) Awareness of my loss in education:
Not at all concerned-----Somewhat concerned------Extremely concerned
(slider answer)

(e) Awareness of how much I am spending on my education:
Not at all concerned-----Somewhat concerned------Extremely concerned
(slider answer)

(19) How likely would the following situations deter you from engaging in non-class related activities on your device?

(a) If the school had an official policy about it
Highly likely ------ Possible ------ Highly unlikely *(slider answer)*

(b) If the professor explicitly stated not to do it

Highly likely ------ Possible ------ Highly unlikely *(slider answer)*

(c) If I like the professor and worry they may feel disrespected
Highly likely ------ Possible ------ Highly unlikely *(slider answer)*

(d) If I were aware of research that indicated this behavior might sabotage my   ability to be
an effective therapist in the future
Highly likely ------ Possible ------ Highly unlikely *(slider answer)*

(20) Do you ever make an effort to avoid non-class related device use?

_____Yes, and it is easy to refrain when I feel I should
_____Yes, but it is hard to refrain and I usually give in
_____Yes, and I turn off my device to reduce temptation
_____No, I use it when I want to and don't when I don't want to

(21) Do you believe that your engagement with your device for non-class-related activities, while in class, could impact your ability to pay attention effectively with your therapy clients?

_____No, I believe there is no impact
_____Yes, it may enhance/positively impact my ability to pay attention to my clients
_____Yes, it may negatively impact my ability to pay attention to my clients
_____Don't know/never thought about it

(Survey skips to question 23 – Questions for all users and non-users)

Why the subject never engages in non-class device use

(22) Why do you not engage in non-class related computer/device usage, during class time?
Check all that apply.

_____I am too interested in the information being presented/discussed
_____I want to gain the maximum benefit from my educational experience
_____It is wrong/unethical
_____It doesn't occur to me to do this
_____I am tempted but worry about being seen and judged
_____I am tempted but I do not want to offend/disturb other students
_____I am tempted but I do not want to risk offending the professor
_____I don't use a computer/device in class
_____Other (please specify):

Questions for all users and non-users:

(23) a) Do you ever notice when other students use their computers/devices for non-class related activities?

_____Yes _____No

      If yes:
      (b) How much does it bother you when you see other students engaging in non-class related activities during class time?
         Not at all ------ Somewhat ------ Extremely *(slider answer)*

      (c) How much does it affect your opinion of the student?
        Very negative opinion----Neutral----Very positive opinion *(slider answer)*

      (d) How much does it distract you when you notice it?
      Not at all ------ Somewhat ------ A lot *(slider answer)*

      (e) How likely are you to engage in a non-class related activity on your computer/device while in class, if you see someone else doing it?
      Not at all ------ Possibly/Sometimes ------ Very likely *(slider answer)*

      (f) Does the size of the class you are in make a difference as to how you view students engaging in non-class related activities (i.e., it matters less in larger classes, more in smaller classes)?
      Makes no difference--Makes a slight difference--Makes a big difference
      (slider answer)

(24) Did you engage in non-class related activities on your computer/device when in undergraduate classes?

    ____Always ____Often ____Occasionally ____Never ____There were no/few computers when I was an undergraduate ____Other (please specify):

Questions about impact of non-class related computer/device use in the classroom

(25) Do you think it impacts the quality of education of those who do it?
Very strong negative impact ---Neutral/no impact---Very strong positive impact
(slider answer)

(26) Do you think it impacts the quality of education of those who are near/next to those who do it, but not doing it themselves?
Very strong negative impact ---Neutral/no impact---Very strong positive impact
(slider answer)

(27) Do you think it impacts the quality of relationships among students?
Very strong negative impact ---Neutral/no impact---Very strong positive impact
(slider answer)

(28) Do you think it impacts relationships between students and professors?
Very strong negative impact ---Neutral/no impact---Very strong positive impact
(slider answer)

Other questions:
(29) Do you find yourself engaging with the internet when you feel you should be doing other work, (when not at school)?

   ____No, never
   ____Sometimes, occasionally
   ____Sometimes, often
   ____Much/most of the time

(30) Has anyone ever said to you that they think you spend too much time on the internet?
_____Yes _____No

(31) Do you ever find it hard to stay present when you need to/want to?
   ___ Yes, all the time]
   ___ Yes, often
   ___ Yes, sometimes
   ___ Yes but rarely
   ___ No, never

(32) Do you engage in any kind of regular meditation or mindfulness practice?
_____Yes _____No

(33) Do you believe that the use of computers for non-class-related activities in your program is a problem that deserves attention? ____Yes _____No

(34) Did you attend to anything else while in the midst of taking this survey?
____Yes ____No

(35) Please share any thoughts you have related to this topic (limit 100 words).

Final Demographic Information

(36) Highest degree earned at present:
_____ Bachelor's   _____ Master's
_____ PhD   _____ Other (please specify):

(37) Type of Clinical Psychology Program you are currently in:

   ____APA-accredited ____non-APA-Accredited

(38) Your professional goal (primarily):
___ Psychotherapy and/or Assessment
___ Research
___ Both Psychotherapy/Assessment and Research

(39) Your current year of study: _____ 1st   _____ 2nd   _____ 3rd
       _____ 4th   _____ 5th or higher

(40) Where is your program located?:
_____ USA (Midwest) _____ USA (Northeast)   _____ USA (Northwest)
_____ USA (South)   _____ USA (West)   _____ USA (Southwest)   _____ Puerto Rico

(41) What is your gender? (Please select all that apply)   _____ Female _____ Male
____Non-binary/Third gender _____Cisgender _____ Transgender
____Prefer not to say ____ Other (please specify):

(42) What is your ethnicity? (Please select all that apply)
_____ American Indian/Alaska Native _____ Hispanic/Latino/Latinx
_____ Asian/Asian American _____ White/White American
_____ Black/African American/Black American ____Biracial/Multiracial
_____ Prefer not to say
_____ Other (please specify):

(43) What is your sexual orientation? _____ Heterosexual _____ Gay/Lesbian
          _____ Bisexual   ___Asexual _____ Queer _____ Questioning
          _____ Prefer not to say _____Other (please specify):

(44) What is your relationship status? _____ Single _____ Married
_____ In a committed relationship _____ Divorced _____ Widowed
____ Prefer not to say ___Other (Please specify):

Please share any thoughts you have related to this topic.

Appendix B: Recruitment Letter

Dear Student,

My name is Elizabeth Rogers, and I am a Psy.D. student at Antioch University New England, in Keene, New Hampshire. I am conducting research for my dissertation, which is entitled "Computer Multitasking in the Classroom: Training to Attend or Wander?" My research focuses on professional psychology students who do (or do not) multi-task on computers or other devices, while in class. This can include using a computer to complete schoolwork unrelated to the current class, or to send personal emails or attend to social media, for example. There is currently a great deal of research on this phenomenon in the field, but very little looking at it from the student perspective. The goal of this study is to examine student behaviors and beliefs around the use of electronic devices in the classroom - their own and that of other students.

To participate, you must be a graduate student pursuing a Psy.D. degree in clinical psychology who is currently attending classes in-person for your graduate degree. To qualify for the study you need to be enrolled full-time in coursework, regardless of whether or not you use a computer in your classes, or how you use it if you have one. In addition you must be taking the majority of your classes in person, not on-line. The data collected in the survey will be completely anonymous and your answers will not be able to be linked to your name, nor to the IP number of your computer.
.
This survey has been estimated to take 15-25 minutes to complete. If you complete the survey, you will have the option to participate in a raffle to win one of two $50 Amazon gift cards.

If you have any questions, please feel free to contact me at xxxxx@antioch.edu. Of note, my research advisor is Roger Peterson, Ph.D, who can be reached at rpeterson@antioch.edu. If you have any questions about your rights as a research participant, you may contact Kevin Lyness, Chair of the Antioch University New England IRB, at klyness@antioch.edu and phone (603) 283-2149. You may also contact Barbara Andrews, Ph.D., Interim Provost, at bandrews@antioch.edu.

To continue, please, click on the link below to be directed to the Informed Consent form and participate in the study.

Thank you very much for your help.

Elizabeth Rogers, MS
Psy.D. anticipated 2019
Antioch University New England
Keene, NH 03431

{link to informed consent page}

Appendix C: Informed Consent

Project Title: Computer multitasking in the classroom: Training to attend or wander?

Purpose of this Research: This study is designed to explore the phenomenon of students of professional psychology using computers or other devices in the classroom for the purpose of multitasking, that is, to engage in tasks that are unrelated to the content of the current class. To date there has been a great deal of research about this phenomenon, but it has mostly been from the perspective of researchers attempting to prove a hypothesis. There has been little or no research on the beliefs and attitudes of students who do or do not engage in multitasking, such as this current study aims to explore. In particular, this research focuses on the behavior of Psy.D. students, who may have a unique relationship to the question of attentiveness as it could impact their work with therapy clients.

Procedures: You are invited to fill out an online survey which will ask questions about your relationship to computers, whether or not you multi-task while in your classes and, if so, what your patterns of engagement and attitudes about it are. There are also questions about multitasking behavior in general, as well as demographic questions. The study has been estimated to take between 15-25 minutes to complete.

Benefits & Risks: Aside from an option to enter a drawing for one of two $50 Amazon gift cards, there are no direct benefits to you for joining this study. However you may appreciate the opportunity to reflect on this particular phenomenon as it applies to you and your classmates. In addition you will be contributing to a body of research that is currently in the media spotlight, and which may have important repercussions for the fields of psychology and education.

There is very minimal risk to students who take part in this research study. The primary risk is that some questions about multitasking in the classroom may cause you to feel a mild sense of discomfort or regret. If this happens and you would like to discontinue, you can exit the survey at any time without penalty.

Confidentiality and Anonymity: To ensure confidentiality, the IP number of your computer will not be recorded by SurveyMonkey. You will not be asked to give any identifying information, unless you wish to enter the drawing for a gift card. If you choose to enter the drawing, you will be provided with an email address to contact once you have reached the end of the survey. Your email address will be kept during data collection for participation in the raffle only and will be collected separately from the data you contribute through the survey. Your answers will be kept private on the protected Survey Monkey website. Your answers will only be accessible to the researcher. The data will be destroyed once the study is complete. This will be done by deleting the survey website. Information about Survey Monkey's Privacy Policy may be found at https://www.surveymonkey.com/mp/policy/privacy-policy/. Additionally, Survey Monkey is HIPAA compliant.

Voluntary Participation: Taking part in this study is entirely voluntary. You may exit the survey at any time, for any reason, without penalty. All the information will be kept completely confidential and will be accessible only to myself, the researcher.

Clicking on "Next" will indicate that you have read this consent form and you willingly give consent to participate. If you do not consent, you may close your browser window now to exit.

{"NEXT" – links to beginning of survey}

Table 1

Survey Questions

Topics	Questions
Relationship with Computers/Internet	Q2. Did you grow up interacting with computers from early childhood (i.e., from before the age of 10)?
	Q4. How comfortable (i.e., fluent) are you using computers?
	Q5. How much time do you spend in a focused, directed manner on your computer when NOT in class, on an average day (e.g., completing work or homework assignments, responding to emails, not "surfing")?
	Q6. How much time in do you spend in an unfocused, non-directed manner on the Internet, on an average day (exploring, surfing, on computer or smart device)?
	Q24. Did you engage in non-class related activities on your computer/device when in undergraduate classes?
	Q29. Do you find yourself engaging with the Internet when you feel you should be doing other work (when not at school)?
	Q30. Has anyone ever said to you that they think you spend too much time on the Internet?

Table 1 Continued

Survey Questions

Topics	Questions
Nature of Computer/Device Use In Class	Q7. Are you currently taking this survey while in class?
	Q8. While in class, do you ever engage in activities on your computer/device that are unrelated to the content of the class you are in? (Answer "yes" even if it is only rarely)
	Q9. What type of device do you use **most** during class (for any reason)?
	Q10. What percent of the time do you engage in non-class related activities on your device?
	Q11. When do you engage in non-class-related activities on your computer, while in class?
	Q12. When you do engage in non-class-related work, roughly what percent of the time do you engage in the following activities?
	Q13. Do you have your computer set for notifications of emails and other messages to come in automatically (so you don't have to actively check)?
	Q14. When you do engage in non-class-related activities on your device in the classroom, how much of it is in the following situations?
	Q15. How true is this for you: I only engage in non-class activities on my computer when…
	a. I believe the professor is unlikely to find out
	b. I believe I am unlikely to offend others (i.e., in a large lecture class)

Table 1 Continued

Survey Questions

Topics	Questions
Feelings Regarding Own Multitasking	Q16. How do you feel in general about your non-class related device use during class?
	Q17a. Does it concern you if other students are aware of your non-class-related use while in class?
	Q17b. [If yes] How much does it concern you if other students know about it?
	Q17c. What are some of the reasons why it concerns you if other students know?
	Q18. How much do the following factors affect how you feel about your non-class related device use:
	a. If I do it in small discussion-based classes
	b. If I do it in large lecture-style classes
	c. If the professor is likely to be aware of it
	d. Awareness of my loss in education
	e. Awareness of how much I am spending on my education
	Q20. Do you ever make an effort to avoid non-class-related computer use?
	Q21. Do you believe that your engagement with your device for non-class-related activities, while in class, could impact your ability to pay attention effectively with your therapy clients?

Table 1 Continued

Survey Questions

Topics	Questions
Scenarios That Could Affect Multitasking	Q19. How likely would the following situations deter you from engaging in non-class-related activities on your device: a. If the school had an official policy about it b. If the professor explicitly stated not to do it c. If I like the professor and worry they may feel disrespected d. If I were aware of research that indicated this behavior might sabotage my ability to be an effective therapist in the future

Table 1 Continued

Survey Questions

Topics	Questions
Students Who Do Not Multitask	Q22. Why do you not engage in non-class-related computer/device usage, during class time?

Table 1 Continued

Survey Questions

Topics	Questions
General Perceptions of Multitasking	Q23a. Do you ever notice when other students use their computers for non-class-related activities?
	b. *[If yes]* How much does it bother you when you see other students engaging in non-class related activities during class time?
	c. How much does it affect your opinion of the student?
	d. How much does it distract you when you notice it?
	e. How likely are you to engage in a non-class-related activity on your computer/device while in class, if you see someone else doing it?
	f. Does the size of the class you are in make a difference as to how you view students engaging in non-class-related activities (i.e., it matters less in larger classes, more in smaller classes)?
	Q33. Do you believe that the classroom use of computers for non-class-related activities in your program is a problem that deserves attention?

Table 1 Continued

Survey Questions

Topics	Questions
Impacts of Multitasking	Q25. Do you think it impacts the quality of education of those who do it? Q26. Do you think it impacts the quality of education of those who are near/next to those who do it, but not doing it themselves? Q27. Do you think it impacts the quality of relationships among students? Q28. Do you think it impacts relationships between students and professors?

Table 1 Continued

Survey Questions

Topics	Questions
Related to Attention/Mindfulness	Q3. Do you identify as having a diagnosis of ADHD (any type)?
	Q31. Do you ever find it hard to stay present when you need to/want to?
	Q32. Do you engage in any kind of regular meditation or mindfulness practice?
	Q34. Did you attend to anything else while in the midst of taking this survey?

Table 2

ANOVA of age with time spent multitasking

Dependent variable: Percentage of class time spent multitasking

Age	Mean	Std. Dev.	N
<26 years	8.48	2.20	42
26–35 years	14.54	2.36	92
>36 years	8.49	1.9	11

Table 3

T-test comparison between time spent multitasking and if it is seen as problematic

Problem?	N	Mean % of time multitasking	Std. Dev.
No	85	15.57	2.30
Yes	60	8.00	2.18

Table 4

ANOVA of age with opinion of others who multitask

Dependent variable: Opinion of others who multitask

Age	Mean	Std. Dev.	N
<26 years	44.20	14.37	40
26–35 years	43.41	11.16	87
>36 years	33.82	16.94	11