



Effects of media multi-tasking with *Facebook* on the enjoyment and encoding of TV episodes



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ABSTRACT

The study examined the consequences of media multi-tasking involving *Facebook* and TV sitcoms. Experiment 1 had participants watch TV episodes of their choosing while interacting with *Facebook*, or on their own, and assessed their enjoyment of the episodes, their overall mood, as well as memory for the episodes. It also examined how these variables were affected by the participants' prior media multi-tasking experience. Experiment 2 manipulated the degree to which participants had to interact with *Facebook* while watching TV episodes. We found that participants enjoyed the episodes more under single task conditions than under dual task conditions, and they recalled more details of the episodes under single task conditions. Moreover, the participants who had to engage in more interactions with *Facebook* had less enjoyment and worse memory than those with less *Facebook* interactions. Finally, those participants that reported frequently engaging in media multi-tasking outside of the experiment benefitted the most from watching the TV episodes under single task conditions.

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1. Introduction

People primarily consume media such as movies and television because they expect enjoyment from doing so (Bryant & Miron, 2002; Sherry, 2004). These allow people to escape into a fantasy world of interesting characters and situations where they can temporarily forget day to day concerns. As with much of modern life, people are introducing distractions into these experiences by media multi-tasking – engaging more than one medium at a time. This has become ubiquitous as more people have smart phones and laptop computers that can readily access sites such as *Facebook*, *Twitter* and *Instagram* while doing other tasks (Junco, 2015; Ralph, Thomson, Cheyne, & Smilek, 2014; Rideout, Foehr, & Roberts, 2010). Indeed, Rideout et al. (2010) reported that youth aged 8–18 years spend on average 29% of the time media multi-tasking, a figure that increased considerably from 16% ten years before. It is therefore not surprising that media multi-tasking has become a burgeoning area of investigation (Carrier, Rosen, Cheever, & Lim, 2015). Many studies have focused on its effects on academic achievement (e.g., Kirschner & Karpinski, 2010; Wood et al., 2012). Little research, however, has examined its effects on processing of entertainment media. Although some work

has been done on the reception and evaluation of information in advertisements (e.g., Chinchanchokchai, Duff, & Sar, 2015), it has not examined consequences of media multi-tasking on the evaluation of shows themselves. As a result, the present study examines the effects of multi-tasking with social media for the enjoyment and encoding of TV episodes.

1.1. Theoretical background

1.1.1. Media multi-tasking and academic performance

Due to the ubiquity of media multi-tasking and its potentially negative effects, researchers have begun to develop metrics for assessing it, as well as conducting studies examining its consequences for cognition and behavior (Ophir, Nass, & Wagner, 2009; Ralph et al., 2014). Much of this has been done to dispel the myth that children and adolescents growing up with an abundance of media technology have superior abilities to fluidly switch from one task to another, with no negative effects on performance (Beastall, 2008; Veen & Vrakking, 2006). For example, although *Facebook* can be used to enrich and support educational activities (e.g., Manca & Ranieri, 2013), research shows that interacting with *Facebook* is often detrimental to academic performance, especially among students who are learning to balance their social and academic responsibilities (Junco, 2015; Wood et al., 2012).

Wood et al. (2012), for example, assigned students to conditions where they had to use *Facebook*, text message, Instant Message

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(IM), use email or partake in a control condition where they took notes using paper and pencil while watching a lecture. They found that only those using *Facebook* performed worse than the control group in a test of the material included in the lecture. In an effort to assess college students' actual media multi-tasking while engaged in school work, Junco (2012) asked participants to state whether, and how frequently, they engaged in various activities during class, ones that included *Facebook*, email, IM, texting, answering calls, and searching the internet for information unrelated to school work. Junco (2012) found that 29% reported using *Facebook* in class at least some of the time. He also found that after controlling for demographic variables and high school GPA, using *Facebook* during class was negatively correlated with college GPA. More recently, Junco (2015) found that likelihood of using *Facebook* while doing schoolwork decreased with academic standing, freshmen being more likely to do so than seniors. Multi-tasking with *Facebook* was also only negatively related to school performance for sophomores and juniors, not seniors.

1.1.2. Media multi-tasking in entertainment

People often engage in media multi-tasking, however, not just when they are working or studying, but also when they are seeking entertainment. When attending a movie theater, for instance, it is common to see people on *Facebook* or texting, despite announcements telling them to turn off their phones so that the movie can be enjoyed fully. This is also the case with TV viewing. A Nielsen report from 2009, for example, found that 57% report using TV and internet simultaneously, with 28% of the time spent on the internet also being spent with the TV on. What effects does media multi-tasking have in this context? Does media multi-tasking increase or decrease people's enjoyment of what they are watching? Does it negatively affect how much they encode and retain of the content? According to Transportation Theory, TV shows and other media portraying narratives are enjoyable and persuasive when people allow themselves to be immersed (Green & Brock, 2000). By doing so viewers are "transported" into the world of the characters, actions and events described in the story. This mental transportation is "a convergent process, where all mental systems and capacities become focused on events occurring in the narrative" (Green & Brock, 2000, p. 701). In this view, enjoyment of TV programs therefore requires concentration and focused attention, as distractions pull viewers away from the fictional world.

1.1.2.1. Multi-tasking and the reception of ads. Although it is reasonable to assume multi-tasking undermines enjoyment and encoding of entertainment media, little research has examined the issue. Most work that has been done has been on advertisements. This is because viewers generally regard commercials as undesirable intrusions that motivate them to shift to other media, leading to concerns about what people actually get from the ads (Monahan, 2011; Nelson, Meyvis, & Galak, 2009). Shapiro and Krishnan (2001), for example, had people process visual ads while attentively listening to a story on the radio (dual task) or ignoring the story on the radio (single task). They found that participants were less able to explicitly recall the names of the products under dual task conditions, though their implicit memory was unaffected by the manipulation. More recently, Chinchanchokchai et al. (2015) examined the consequences of media multi-tasking on the evaluation of ads. They had participants watch commercials on their own, or while performing additional tasks that included typing which of two letters appeared on a screen, and pressing the "." key whenever a circle appeared on a screen. They found that multi-tasking actually yielded higher evaluations of the ads as well as greater overall enjoyment. Moreover, they discovered that the effects of multi-tasking were mediated by perceptions of how quickly time

went by. Likewise, Voorfeld (2011), and Yoon, Choi, and Song (2011) found that multi-tasking led to higher evaluations of ads, and they aver that this is due to multi-tasking impeding the ability to critique the content of the ads.

1.1.2.2. Multi-tasking and the reception of TV episodes. Even if ads are more enjoyable under dual task conditions, it does not follow that TV programs are too, as they are not generally regarded as annoying distractions. Immersion and focused attention may thus be important for viewing TV shows. Consistent with this claim, people report preferring to watch programs without commercial interruptions, and such interruptions sometimes yield negative attitudes toward the ads, especially for highly transported viewers (Wang & Calder, 2006). Nelson et al. (2009), however, found that commercial interruptions can actually enhance the TV viewing experience. Specifically, they found that people rated a target program as more enjoyable when it had commercial interruptions than when it did not, regardless of the quality of the ad. This is because the ads serve to prevent hedonic adaptation, which is the tendency for people's enjoyment to decrease the more time is spent on an activity. Moreover, other studies have found that commercial interruptions do not affect viewers' memory for content of the program (e.g., Cavanaugh, 1984). Nonetheless, commercial interruptions are very different from media multi-tasking. This is because during a commercial break the TV program stops, so the viewer does not miss any content. Furthermore, TV programs often have editing features such as recaps that enable viewers to once more become immersed in the content. Media multi-tasking, however, is likely to cause viewers to miss important details of the narrative, and even if the viewer does process the content, it is likely that the quality of the processing will be lower than if they are just attending to the program (Jeong & Fishbein, 2007; Nightingale, 2004).

To our knowledge, no studies have examined how dividing attention affects the encoding of information in TV programs. Some, however, have found that watching TV programs as a secondary task negatively affects memory and comprehension for what is read in news stories (Armstrong, Boiarsky, & Mares, 1991; Zhang, Jeong, & Fishbein, 2010). The reason for this is that people have a limited cognitive capacity to process information, and demands can exceed available resources when people try to process additional information other than that demanded by the primary task (Junco, 2012; Mayer & Moreno, 2003). Working memory, the locus of active information processing, has limited resources that are apportioned to storage and processing (Baddeley, 1986). For encoding to take place, people need to represent information from the episode they are watching, and they need resources to process and elaborate on those representations, with memory and comprehension being a byproduct of that processing (Jeong & Fishbein, 2007). As Junco (2012) states, "If processes are overloaded through incidental processing, deeper cognitive processing and learning cannot occur" (p. 2237).

Another factor that may affect the encoding and enjoyment of TV episodes is the amount of media-multi-tasking a person normally engages in (Jeong & Fishbein, 2007). Habitual media multi-tasking individuals may have attentional processes that make it less likely that they will be transported into the world of the narrative, either because of a preference for breadth instead of focused attention or because of difficulties in switching across tasks. Regarding the former, Ralph et al. (2014) found positive correlations between levels of media multi-tasking and self-reported attentional failures, as well as positive correlations with spontaneous and deliberate mind wandering. This is consistent with the view that high media multi-taskers prefer to cast a wide net in terms of information that is processed, with a bias toward seeking novelty in the environment. In terms of task switching, using a stimulus classification task, Ophir et al. (2009) found that high

media multi-taskers exhibited greater task-shift costs, despite their greater practice doing so. Similar results have been found by others (e.g., Cain & Mitroff, 2011; Sanbonmatsu, Strayer, Medeiros-Ward, & Watson, 2013; but for exceptions see Alzahabi & Becker, 2013; Minear, Brasher, McCurdy, Lewis, & Younggren, 2013; Ralph, Thomson, Seli, Carriere, & Smilek, 2015). Recent research suggests that the deficits in task switching among high media multi-taskers may stem from smaller gray matter density in the anterior cingulate cortex (ACC), a brain region crucial for the control of attention (Loh & Kanai, 2014).

Of course, it is possible that even though media multi-tasking interferes with the reception of TV episodes, people may engage in it to fulfill other needs. Indeed, Wang and Tchernev (2012) found that although people do not satisfy cognitive needs from engaging in media multi-tasking (i.e., needs related to strengthening knowledge and information acquisition), they do satisfy emotional needs from doing so (i.e., needs related to pleasurable experiences). If this is the case, people may experience greater overall enjoyment by engaging in media multi-tasking, even if they encode less and enjoy the episodes less when doing so.

1.2. The present study

We examined the consequences of interacting with *Facebook* while watching TV sitcoms. In Experiment 1, participants watched TV sitcoms of their choosing while interacting with *Facebook*, or just watched them on their own, and we assessed their enjoyment of those episodes, their overall positive and negative affect, as well as their memory for details of those episodes. We also examined how TV episode enjoyment and encoding were affected by the participants' experience of interacting with *Facebook* while doing other things. Experiment 2 was similar to Experiment 1 except that it manipulated the degree to which participants had to interact with their *Facebook* accounts while watching TV episodes during the study.

We predicted participants would enjoy the episodes more under single task (ST) conditions than dual task (DT) conditions, and that they would recall more details of the episodes under ST conditions. This is because multi-tasking with *Facebook* while watching the TV programs is likely to prevent immersion in the world of the story, which will inhibit processing and elaboration of the content. Moreover, we predicted that the results would be particularly marked for those who have greater prior experience engaging in media multi-tasking with *Facebook*, and for those people that have to partake in more interactions with *Facebook* under DT conditions in the present study. The former can be seen as "trait" media multi-taskers, and the latter "state" media multi-taskers. We also measured positive affect and negative affect following the episodes to determine whether media multi-tasking led to overall better moods in the participants, irrespective of how they received the TV episodes.

2. Experiment 1

This experiment had participants watch TV sitcoms either under ST conditions or under DT conditions where they interacted with *Facebook* at the same time. We recorded their enjoyment of the episodes and their overall positive and negative affect, as well as assessing their memory for details of the episodes by presenting them with multiple choice questions following the episodes. The present study also had participants rate the degree to which they typically multi-task while interacting with *Facebook*, which ratings were used to categorize them as high or low media multi-taskers.

2.1. Method

2.1.1. Participants

One hundred and twenty-two undergraduate students from California State University, Long Beach participated in the study, 95 female and 27 male. They were between the ages of 18 and 23, and with a mean age of 18.6 years. All were introductory psychology students who participated in exchange for course credit. Only people who had a *Facebook* account that they were willing to access during the experiment participated.

2.1.2. Materials

2.1.2.1. TV shows. Participants were presented with a list of 10 popular situation comedies along with brief descriptions of what they were about. Shows were selected to represent a broad range of humor types likely to be popular with undergraduates. They were told to choose two different shows from this list, preferably ones they had not seen before. The shows were less than 30 min in length and included two episodes from each of the following series: *How I Met Your Mother*, *The Office*, *Scrubs*, *30 Rock*, *New Girl*, *Wilfred*, *It's Always Sunny in Philadelphia*, *American Dad*, *Arrested Development*, and *Parks and Recreation*. We used Netflix connected to a 27" TV screen to present the episodes to participants.

2.1.2.2. Episode encoding questionnaires. To assess how much information was encoded about the episodes, we created quizzes for each. The quizzes consisted of 10 multiple choice questions that asked about the episode's contents including, for example, questions about key features of the plot and about the actions and dialogue of specific characters. A sample quiz is included in the Appendix. The dependent variable was the total number of questions out of 10 answered correctly.

2.1.2.3. Positive and negative affect. Positive affect (PA) and negative affect (NA) were measured using the Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988). The scale consists of 20 affect terms that are rated on Likert scales ranging from 1 (very slightly or not at all) to 5 (extremely). Positive affect words include, for example, "interested," "excited," and "inspired" while negative affect words include, among others, "distressed," "upset," and "hostile." Participants were told to rate these depending on how they are feeling at the present time.

2.1.2.4. Enjoyment questionnaire. A questionnaire was used to assess how much participants enjoyed the episodes they watched. It consisted of five questions, two of which are central to the present investigation and three that were filler items. The critical questions asked "How much did you enjoy this episode?" and "How engaging was this episode?" They rated their enjoyment using Likert scales that ranged from 1 (not at all) to 6 (very much).

2.1.2.5. Facebook use questionnaire. A *Facebook* activity questionnaire was used to assess the degree to which participants typically multi-task while on *Facebook*. It consisted of four questions that asked about how participants typically interact with *Facebook*, including the critical question "How often are you on *Facebook* while doing other things?" Participants responded using Likert scales ranging from 1 (not at all) to 6 (very often). We used the ratings to the critical question to separate our participants into high *Facebook* multi-taskers and low *Facebook* multi-taskers. Those that rated it 1–3 were assigned to the "low" group and those rating it 4–6 were assigned to the "high" group. A total of 59 participants were in the low group and 63 in the high group.

2.1.2.6. Testing environment. Participants were asked to access their *Facebook* accounts using a computer located immediately to the

right of the TV screen. They were informed that the experimenter would ask them to do specific tasks on *Facebook* at certain points during the study. In particular, participants were asked to: (1) Update their *Facebook* status fifteen minutes into the episode, (2) Comment on a picture on their newsfeed at sixteen minutes, (3) Write a short comment on the wall of a friend that appeared on their page at eighteen minutes, and (4) Search for “CSULB Psychology Research: Effects of Media Multi-tasking,” then indicate the “like” status of the picture of the TV show they were watching at twenty minutes.

2.1.3. Procedure

When participants entered the lab environment they read and signed the consent form. Then they completed a PANAS to assess baseline mood. Once they completed it, they were presented with the list of TV shows and episodes, and asked to pick two shows, one episode from each, to watch. Participants were randomly assigned to one of two groups, based on which condition they did first, the ST or DT condition. After watching each episode, participants were once again given the PANAS, the enjoyment questionnaire, and the episode encoding questionnaire that corresponded to the episode they saw, in that order. After completing these tasks for both episodes, participants filled out the *Facebook* use questionnaire, and they were debriefed and thanked for their participation. All tasks were completed within an hour.

2.2. Results

2.2.1. Effects on episode enjoyment

To examine the effects of multi-tasking with *Facebook*, and experience doing so, on the enjoyment of the TV episodes, we carried out two separate $2 \times 2 \times 2$ mixed factor ANOVAs on the ratings given to two questions – “How much did you enjoy this episode?” and “How engaging was this episode?” Both were rated on a 1–6 scale, higher values indicating greater enjoyment. The repeated measures factor was Condition (ST vs. DT), and the between subjects factors were *Facebook* multi-tasking experience (High vs. Low) and Order (ST1 vs. ST2). Order refers to whether participants did the single task condition first (ST1) or the dual task condition first (DT1). It was included because of the potential for hedonic adaptation (Nelson et al., 2009). It is possible, for example, that one condition yields more adaptation than the other, leading to greater decreases in enjoyment during the subsequent task.

For the question asking about the engagingness of the episodes, the results revealed a significant effect of Condition, $F(1, 118) = 6.52$, $p = .012$, $\eta_p^2 = .052$ (see Fig. 1). People reported higher levels of engagement during the ST condition ($M = 4.60$,

$SE = 0.12$) than during the DT condition ($M = 4.23$, $SE = 0.13$). There was also a marginally significant interaction between Condition and Order, $F(1, 118) = 3.73$, $p = .056$, $\eta_p^2 = .031$. Simple effects tests revealed that for the ST condition, those who watched the ST first did not rate it more engaging than those who watched it second, $F(1, 118) = .26$, $p = .61$. In the DT condition, those who watched the DT episode first rated it more engaging than those who watched it second, $F(1, 118) = 3.28$, $p = .07$, $\eta_p^2 = .03$. There was no significant main effect of Order, $F(1, 118) = 0.72$, $p = .399$, or *Facebook* multi-tasking experience, $F(1, 118) = .05$, $p = .95$. There was also no significant interaction between Condition and *Facebook* multi-tasking experience, $F(1, 118) = 2.50$, $p = .12$ (see Fig. 2), between Order and *Facebook* multi-tasking experience, $F(1, 118) = .20$, $p = .66$, or between Condition, Order and *Facebook* multi-tasking experience, $F(1, 118) = 2.28$, $p = .134$.

Regarding the question asking explicitly about enjoyment of the episodes, there was no significant effect of Condition, $F(1, 118) = 1.37$, $p = .244$. There was, however, a marginally significant interaction between Condition and *Facebook* multi-tasking experience, $F(1, 118) = 3.17$, $p = .078$ and a marginally significant interaction between Condition and Order, $F(1, 118) = 3.59$, $p = .061$. These were qualified by an interaction between Condition, Order, and *Facebook* multi-tasking experience, $F(1, 118) = 3.68$, $p = .057$. Post hoc tests revealed that for those with high *Facebook* multi-tasking experience there was a significant effect of Condition, $F(1, 61) = 4.73$, $p = .033$, $\eta_p^2 = .07$ (see Fig. 3). They enjoyed the episode that they watched under ST conditions more ($M = 4.82$, $SE = .14$) than the one they watched under DT conditions ($M = 4.38$, $SE = .15$). For them there was no interaction between Condition and Order, $F(1, 61) = 4.73$, $p = .99$. In contrast, for those with low multi-tasking experience, there was no significant effect of Condition, $F(1, 57) = .17$, $p = .68$. There was a significant interaction between Condition and Order, $F(1, 57) = 6.69$, $p = .012$, $\eta_p^2 = .11$. Simple effects tests, however, did not find significant order effects for either the ST or DT condition. For the ST condition, those who watched it first did not enjoy it more than those who watched it second, $F(1, 57) = 2.65$, $p = .109$. For the DT condition, those who watched the DT first also did not enjoy it more than those who watched it second, $F(1, 57) = 2.07$, $p = .156$.

Our analysis of the effects of *Facebook* multi-tasking experience consists of a median split. While this can be used to determine whether or not a relationship between variables exists, a limitation is that some power is lost by dichotomizing a continuous variable. Furthermore, participants can be misclassified due to measurement error, which is a concern for participants who are on either side of the cut off for high and low multi-tasking experience

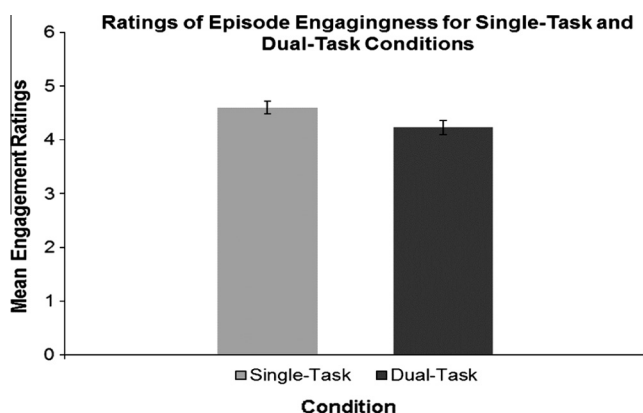


Fig. 1. Mean ratings of episode engagement as a function of condition (single-task, dual-task) in Experiment 1. Each error bar represents mean \pm standard error.

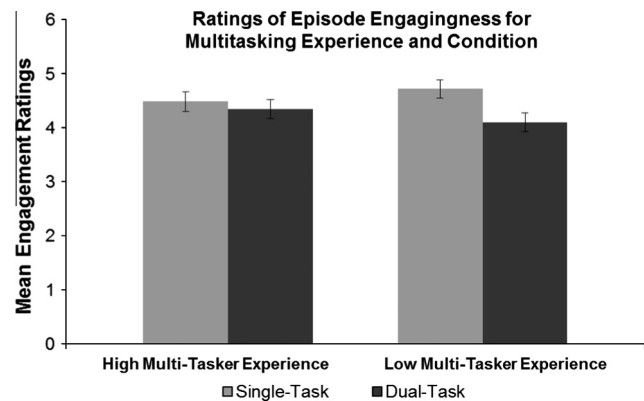


Fig. 2. Mean ratings of episode engagement as a function of multi-tasking experience (high, low) and condition (single-task, dual-task) in Experiment 1. Each error bar represents mean \pm standard error.

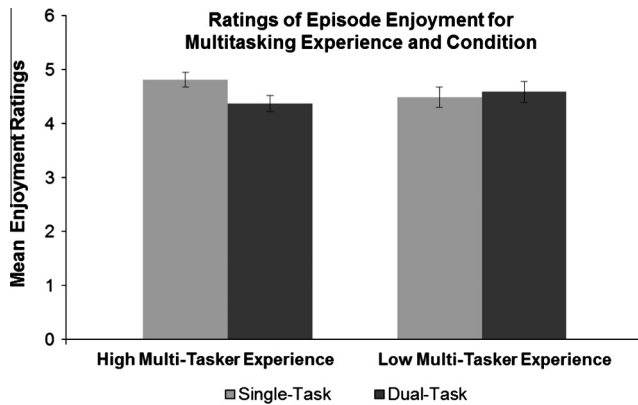


Fig. 3. Mean ratings of episode enjoyment as a function of multi-tasking experience (high, low) and condition (single-task, dual-task) in Experiment 1. Each error bar represents mean \pm standard error.

(Conway et al., 2005). As a result, we also used correlational analyses to examine the relation between *Facebook* multi-tasking experience and enjoyment of the TV episodes under ST and DT conditions. We found that amount of *Facebook* multi-tasking experience was positively correlated with how engaging participants rated the episodes under ST conditions ($r = +.21, p = .02$) and with participant ratings of how much they enjoyed the episodes under ST conditions ($r = +.24, p = .007$). It was not correlated with engagingness of the DT episodes ($r = -.10, p = .293$) or with enjoyment of the DT episodes ($r = -.10, p = .292$). In sum, the more experience multi-tasking with *Facebook* they had, the more they enjoyed just watching the TV episodes.

2.2.2. Effects on positive affect and negative affect

To determine whether interacting with *Facebook* and whether experience doing so affected PA and NA, we carried out a series of $2 \times 2 \times 2$ mixed factors ANOVAs, with Condition (ST vs. DT) as the repeated measures factor, and Order (ST1 vs. DT1) and *Facebook* multi-tasking experience (High vs. Low) as the between subjects factors. The ANOVAs were carried out on the PA and NA scores recorded using the PANAS following each episode.

For PA, we found no main effect of Condition, $F(1, 118) = .059, p = .443$. There was also no main effect of *Facebook* multi-tasking experience, $F(1, 118) = .58, p = .447$, and no main effect of Order, $F(1, 118) = .022, p = .88$. There was, however, a significant interaction between Condition and Order, $F(1, 118) = 22.76, p < .001, \eta_p^2 = .162$. Post hoc tests revealed that, for the ST condition, there was a marginally significant effect of order, $F(1, 118) = 2.79, p = .097, \eta_p^2 = .02$, with higher PA when ST was done first rather than second. For the DT condition, there was no significant difference in PA between those who did it first and those who did it second, $F(1, 118) = 1.59, p = .21$. There was no interaction between Condition and *Facebook* multi-tasking experience, $F(1, 118) = .65, p = .42$, or between Condition, Order, and *Facebook* multi-tasking experience, $F(1, 118) = 1.99, p = .16$.

Regarding NA, the analysis revealed that participants had greater NA following the DT condition ($M = 1.20, SE = 0.03$) than after the ST condition ($M = 1.12, SE = 0.02$), $F(1, 118) = 15.53, p < .001, \eta_p^2 = .116$. There was no main effect of *Facebook* multi-tasking experience, $F(1, 118) = .65, p = .42$, and no main effect of Order, $F(1, 118) = 2.41, p = .12$. Condition did not interact with *Facebook* multi-tasking experience, $F(1, 118) = .08, p = .78$, or with Order, $F(1, 118) = .88, p = .35$. There was no three way interaction between Condition, Order and *Facebook* multi-tasking experience, $F(1, 118) = .67, p = .415$. In sum, people experienced more NA after watching a TV program when they were also interacting with *Facebook* than if they just watched the TV program.

A correlational analysis also examined the relationship between *Facebook* multi-tasking experience and PA and NA following the ST and DT conditions and found a significant correlation between *Facebook* multi-tasking experience and PA following the ST episode ($r = +.26, p = .044$). The more experience they had multi-tasking the more PA they reported after just watching the TV episode. *Facebook* multi-tasking experience was not correlated with ST NA ($r = +.18, p = .16$), with DT PA ($r = +.13, p = .33$), or with DT NA ($r = +.19, p = .15$).

2.2.3. Effects on information encoding

To examine whether multi-tasking with *Facebook* while watching TV episodes affected people's ability to recall information about those episodes, we carried out a $2 \times 2 \times 2$ mixed factor ANOVA with Condition (ST vs. DT) as the repeated-measures factor, and *Facebook* multi-tasking experience (High vs. Low) and Order (ST1 vs. DT1) as the between subjects factors. The results revealed a main effect of Condition, $F(1, 118) = 12.98, p < .001, \eta_p^2 = .10$. Participants answered more questions correctly in the ST condition ($M = 8.61, SE = 0.12$) than in the DT condition ($M = 8.00, SE = 0.14$). There was no main effect of *Facebook* multi-tasking experience, $F(1, 118) = .43, p = .51$ and no main effect of Order, $F(1, 118) = .15, p = .70$. There was, however, a significant interaction between Condition and *Facebook* multi-tasking experience, $F(1, 118) = 6.82, p = .01, \eta_p^2 = .06$ (see Fig. 4). For those that were low in *Facebook* multi-tasking experience, there was no difference in accuracy between ST and DT conditions, $F(1, 57) = .60, p = .44$. For those that are high in multi-tasking experience, however, there was a main effect of Condition, $F(1, 61) = 16.65, p < .001, \eta_p^2 = .21$. They were more accurate under ST ($M = 8.77, SE = 0.15$) than under DT conditions ($M = 7.72, SE = 0.21$). In the main ANOVA there was no interaction between Condition and Order, $F(1, 118) = .96, p = .33$, or between Condition, Order and *Facebook* multi-tasking experience, $F(1, 118) = .00, p = 1$.

A correlational analysis examined the relationship between *Facebook* multi-tasking experience and memory for content of the episode. We found a marginally significant correlation between *Facebook* multi-tasking experience and accuracy for the ST condition ($r = +.22, p = .091$). There was no correlation with accuracy for the DT condition ($r = -.20, p = .136$).

We also examined correlations between participants' ratings of the engagingness of the episodes and how enjoyable they were and their accuracy at answering questions about the episodes under ST and DT conditions. These results are summarized in Table 1. The results revealed that the ratings of episode engagingness are highly

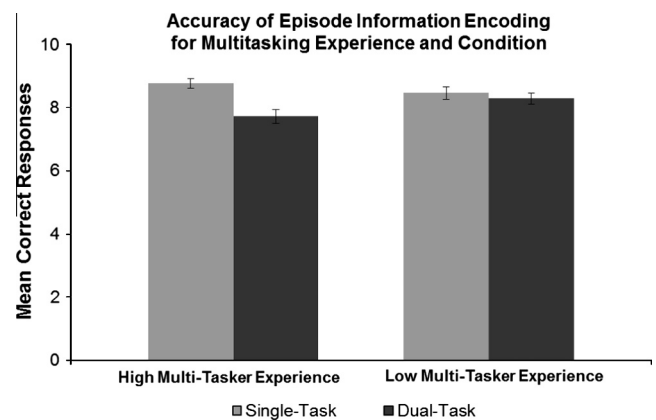


Fig. 4. Mean accuracy scores for the information encoded about the episodes as a function of multi-tasking experience (high, low) and condition (single task, dual task) in Experiment 1. Each error bar represents mean \pm standard error.

positively correlated with the ratings of enjoyment, especially within the ST and DT conditions. Furthermore, the ratings of episode engagingness and enjoyment were positively correlated with participants' accuracy at answering questions about the episodes. This was only marginally significant in the case of the correlation between engagingness and accuracy for the DT condition ($p = .084$), but significant at $p < .05$ in all other cases. In short, people reported enjoying the episodes more when they also remembered more about what had happened.

3. Experiment 2

The purpose of the second experiment was to determine whether the amount of interaction that people have with Facebook under DT conditions in the present study affects their enjoyment of the TV sitcoms, their overall positive and negative affect, and their ability to recall details of those episodes. The method that was used was similar to that of Experiment 1, except that we incorporated a between subjects condition where we manipulated the degree to which people had to interact with Facebook. Half of the participants had a low level of interaction while the other half had a high level of interaction.

3.1. Method

3.1.1. Participants

In this experiment, 139 undergraduate students from California State University, Long Beach participated in exchange for course credit in their introductory psychology classes. Of these, 102 were female and 37 were male. They ranged in age from 18 to 24 years, with a mean age of 19.02 years. Only those with an active Facebook account that they were willing to access during the experiment participated.

3.1.2. Materials

Experiment 2 used the same TV episodes as Experiment 1. In addition, it used the same episode encoding quizzes, enjoyment questionnaire, and PANAS.

3.1.3. Facebook interaction

Like Experiment 1, participants took part in both, a ST condition and a DT condition, with half of the participants doing the ST first, and the other half doing the DT condition first. During the DT condition, however, we manipulated the degree to which participants had to interact with Facebook. Half of the participants had a high level of interaction with Facebook (HFB), while the other half had a low level of interaction with Facebook (LFB). Those placed in the LFB condition only had four interactions, while those in the HFB condition interacted with Facebook ten times throughout the episode. Those in the LFB condition had to: (1) Update their Facebook status five minutes into the episode, (2) Write a short

comment on a picture that appeared on their newsfeed at ten minutes, (3) Click on friends and write a short comment on the wall of a friend at fifteen minutes, (4) Search for "CSULB Psychology Research: Effects of Media Multi-tasking," then indicate the "like" status of the TV show they were watching at twenty minutes. Those in the HFB condition, starting two minutes into the episode (and every two minutes after that), had to: (1) Update their Facebook status, (2) Write a short comment on a picture that appeared on a friend's wall, (3) Indicate the "like" status of a post that appeared in their newsfeed, (4) Click on friends, and write a short comment on the wall of a friend, (5) Write a brief message to a friend, (6) Write a short comment on the status update of a female friend, (7) Write a comment on the status update of a male friend, (8) Delete their own status update, (9) Search for "CSULB Psychology Research: Effects of Media Multi-tasking," and (10) Indicate the "like" status of the TV show they were watching.

3.1.4. Procedure

After participants read and signed the consent form, they were given the PANAS questionnaire to assess their baseline mood. Following its completion, participants chose two TV episodes to watch. After each episode concluded, participants were handed another PANAS, an enjoyment questionnaire, and an episode encoding quiz, in that order. At the completion of all questionnaires for both TV episodes, participants were debriefed and dismissed. All tasks were completed within an hour.

3.2. Results

3.2.1. Effects on episode enjoyment and engagement

To examine how much participants enjoyed the episodes, we analyzed their responses to two questions separately. These are first, the question that asked how engaging they felt the episode to be and second, the question asking them how much they enjoyed the episode. We carried out a $2 \times 2 \times 2$ mixed factors ANOVA, with Condition (ST vs. DT) as a repeated measures factor and Order (ST1 vs. DT1) and Level of DT Involvement (LFB vs. HFB) as between subject factors. This was done on the ratings for each question.

For the question asking about how engaging the episode was, the results revealed a significant effect of Condition, $F(1, 135) = 9.59$, $p = .002$, $\eta_p^2 = .066$ (see Fig. 5). People felt more engaged under ST ($M = 4.54$, $SE = 0.11$) than DT conditions ($M = 4.14$, $SE = 0.11$). There was no main effect of Order, $F(1, 135) = 0.66$, $p = .42$, and no main effect of Level of DT involvement,

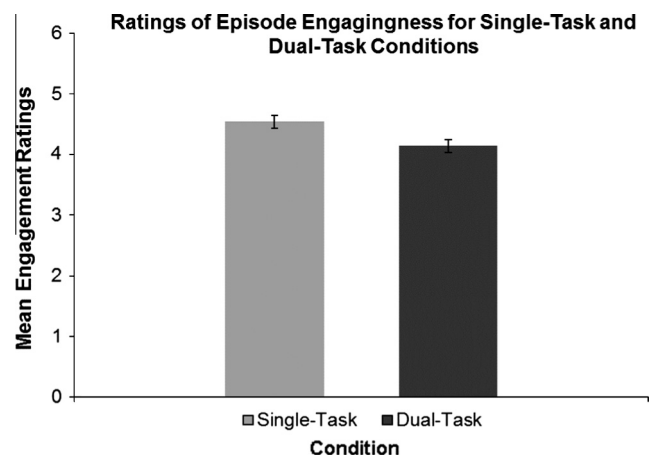


Fig. 5. Mean ratings of episode engagement as a function of condition (single-task, dual-task) in Experiment 2. Each error bar represents mean \pm standard error.

Table 1

Pearson correlations between engagement, enjoyment and accuracy under ST and DT conditions in Experiment 1.

	1	2	3	4	5	6
Engagement (ST)	–	.807**	.257**	.121	.216*	.095
Enjoyment (ST)		–	.138	.148	.229*	.047
Engagement (DT)			–	.804**	.037	.157
Enjoyment (DT)				–	.055	.210*
Accuracy (ST)					–	.112
Accuracy (DT)						–

Note: ST = single task; DT = dual task.

* $p < .05$.

** $p < .01$.

$F(1, 135) = 1.12, p = .29$. There was, however, an interaction between Condition and Level of DT involvement, $F(1, 135) = 4.65, p = .033, \eta_p^2 = .033$. Simple effects analyses revealed that when the Level of DT involvement was low, there was no effect of Condition, $F(1, 67) = .54, p = .47$. When Level of DT involvement was high, there was an effect of Condition with ST yielding higher ratings of engagingness, $F(1, 68) = 11.80, p = .001, \eta_p^2 = .15$. The main ANOVA also revealed an interaction between Condition and Order, $F(1, 135) = 5.89, p = .017$. For the ST condition there was no effect of Order, $F(1, 135) = .72, p = .40$. For the DT condition, there was an effect of Order, $F(1, 135) = 4.41, p = .038, \eta_p^2 = .03$. Those who did the DT second reported less engagement than those who did it first. The main ANOVA yielded no interaction between Condition, Order, and Level of DT involvement, $F(1, 135) = .95, p = .33$.

For the question explicitly asking about enjoyment, there was an effect of Condition, $F(1, 135) = 8.12, p = .005, \eta_p^2 = .06$ (see Fig. 7). Participants reported greater enjoyment following the ST ($M = 4.53, SE = 0.11$) than the DT condition ($M = 4.12, SE = 0.11$). There was also a marginally significant effect of Level of DT involvement, $F(1, 135) = 3.13, p = .079, \eta_p^2 = .02$ (see Fig. 6). When DT involvement was lower (LFB), people enjoyed the episode more ($M = 4.47, SE = 0.12$) than when the DT involvement was higher (HFB, $M = 4.18, SE = 0.12$). Level of DT involvement interacted with Condition, $F(1, 135) = 3.97, p = .048, \eta_p^2 = .03$. In the LFB group there was no effect of Condition, $F(1, 67) = .38, p = .54$. In the HFB condition, however, there was an effect of Condition with the ST condition yielding greater enjoyment than the DT condition, $F(1, 68) = 11.41, p = .001, \eta_p^2 = .14$. There was also a significant interaction between Order and Condition, $F(1, 135) = 9.09, p = .003, \eta_p^2 = .063$. For the ST condition, there was no effect of Order, $F(1, 135) = 2.13, p = .15$. For the DT condition, there was an effect of Order with those doing it first rating it more enjoyable than those doing it second, $F(1, 135) = 5.81, p = .017, \eta_p^2 = .03$. The main ANOVA also revealed no significant interaction between Condition, Level of DT involvement and Order, $F(1, 135) = .09, p = .91$.

3.2.2. Effects on positive affect and negative affect

To examine whether ST or DT conditions affected PA and NA, we carried out a series of $2 \times 2 \times 2$ mixed factors ANOVAs, with Condition (ST vs. DT) as a repeated measures factor and Order (ST1 vs. DT1) and Level of DT Involvement (LFB vs. HFB) as between subjects factors. These analyses were carried out on both the PA and NA scores from the PANAS ratings collected after each TV

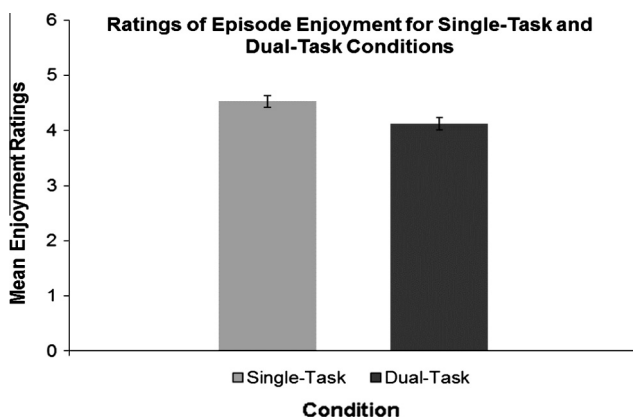


Fig. 6. Mean ratings of episode enjoyment as a function of condition (single-task, dual-task) in Experiment 2. Each error bar represents mean \pm standard error.

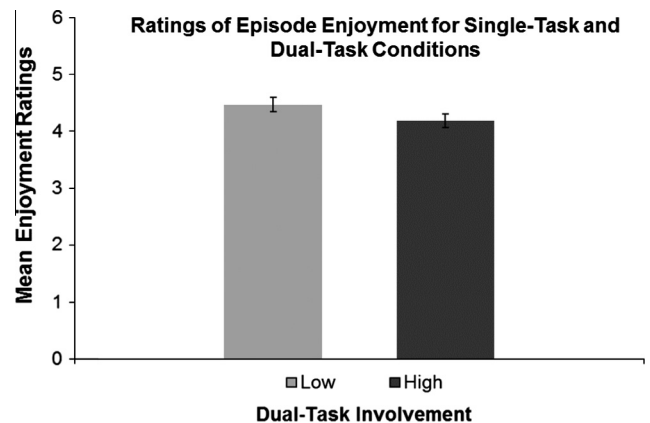


Fig. 7. Mean ratings of episode enjoyment as a function of dual-task involvement (low, high) in Experiment 2. Each error bar represents mean \pm standard error.

episode. With respect to PA, we found no main effect of Condition $F(1, 135) = .08, p = .78$, and no main effect of Level of DT involvement, $F(1, 135) = .42, p = .52$. There was also no main effect of Order, $F(1, 135) = .67, p = .41$. There was, however, a significant interaction between Condition and Level of DT involvement, $F(1, 135) = 4.86, p = .029, \eta_p^2 = .04$. Simple effects analyses revealed that in the LFB group there was no effect of Condition, $F(1, 67) = 1.54, p = .22$. In the HFB group there was an effect of Condition, $F(1, 68) = 3.85, p = .054, \eta_p^2 = .054$, with PA being greater in the ST ($M = 2.54, SE = .11$) than in the DT condition ($M = 2.43, SE = .10$). The main ANOVA also revealed a significant interaction between Condition and Order, $F(1, 135) = 23.83, p < .001, \eta_p^2 = .15$. Post hoc tests revealed that for the ST condition there was an effect of Order, with PA rated higher when ST was done first than second, $F(1, 135) = 4.33, p = .039, \eta_p^2 = .03$. For the DT condition there was no effect of Order, $F(1, 135) = .33, p = .57$. The ANOVA revealed no interaction between Condition, Order and Level of DT involvement, $F(1, 135) = .18, p = .68$.

With respect to NA, the ANOVA revealed a significant main effect of Condition, $F(1, 135) = 11.96, p = .001, \eta_p^2 = .08$. Specifically, NA was lower after the ST condition ($M = 1.15, SE = .02$) than after the DT condition ($M = 1.26, SE = .04$). There was also a main effect of Order, $F(1, 135) = 4.48, p = .036, \eta_p^2 = .03$, with those that did ST1 having higher NA rating ($M = 1.26, SE = .03$) than those that did DT1 ($M = 1.15, SE = .03$). There was no effect of Level of DT involvement, $F(1, 135) = .09, p = .76$, no interaction between Condition and Order, $F(1, 135) = .03, p = .86$, and no interaction between Condition and Level of DT involvement, $F(1, 135) = .05, p = .82$. There was also no interaction between Condition, Order, and Level of DT involvement, $F(1, 135) = .56, p = .46$.

Evidently, the greatest effects of multi-tasking on mood appear to be with respect to NA. NA was lower following the ST condition than following the DT condition. Media multi-tasking did lower PA, but only when the concurrent task demands were high.

3.2.3. Effects on information encoding

To examine the effects of multi-tasking on the encoding of information about the TV episodes, we carried out a $2 \times 2 \times 2$ mixed factors ANOVA, with Condition (ST vs. DT) as a repeated measures factor and Order (ST1 vs. DT1) and Level of DT Involvement (LFB vs. HFB) as between subject factors. This was done on the mean accuracy score for the ST and DT episodes. We found a significant main effect of Condition, $F(1, 135) = 70.34, p < .001, \eta_p^2 = .34$ (see Fig. 8). Participants were able to correctly

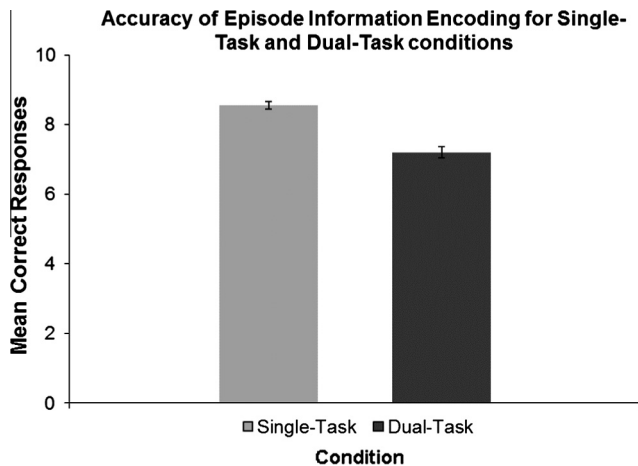


Fig. 8. Mean accuracy scores for the information encoded about the episodes as a function of condition (single-task, dual-task) in Experiment 2. Each error bar represents mean \pm standard error.

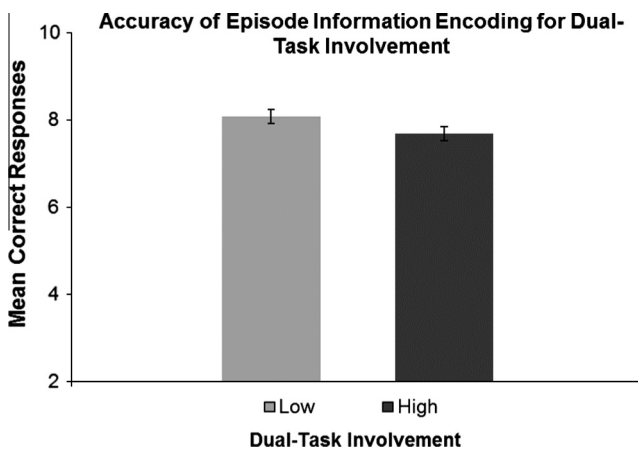


Fig. 9. Mean accuracy scores for the information encoded about the episodes as a function of dual-task involvement (low, high) in Experiment 2. Each error bar represents mean \pm standard error.

answer more questions about the episodes under ST conditions ($M = 8.55$, $SE = 0.11$) than under DT conditions ($M = 7.20$, $SE = 0.16$). There was also a marginally significant effect of Level of DT involvement, with those in the LFB group answering more questions correctly ($M = 8.07$, $SE = 0.16$) than those in the HFB group ($M = 7.68$, $SE = 0.16$), $F(1, 135) = 2.91$, $p = .09$, $\eta_p^2 = .02$ (see Fig. 9). There was no significant interaction between Condition and Order, $F(1, 135) = .49$, $p = .49$, between Condition and Level of DT involvement, $F(1, 135) = .11$, $p = .74$, or between Condition, Order and Level of Level of DT involvement, $F(1, 135) = .90$, $p = .34$.

4. General discussion

We examined the effects of multi-tasking with *Facebook* while watching TV sitcoms on enjoyment of the episodes, on memory for facts about them, and on overall mood. Experiment 1 found that people rated the shows watched under ST conditions to be more engaging than under DT conditions. Moreover, the greater enjoyment of the ST episodes was particularly evident for those high in *Facebook* multi-tasking experience, that is, for the habitual media multi-taskers. Watching sitcoms while interacting with *Facebook* also increased negative affect, and in terms of positive affect, the greater the *Facebook* multi-tasking experience, the more

positive affect participants experienced after watching the ST episodes. Experiment 1 also found that participants remembered more details of the episodes under ST conditions, a finding that was present especially in those who habitually multi-task with *Facebook*. Being able to answer questions about the episodes was also positively related to the degree to which participants enjoyed the episodes. Experiment 2 similarly found episodes to be more engaging and enjoyable under ST conditions and that people remembered more details about them under ST conditions. It also found that having participants engage in more interactions with *Facebook* during the experiment led to less enjoyment of the DT episodes and less memory for their content compared to when they had to engage in fewer interactions. Experiment 2 also found that watching episodes under DT conditions increased negative affect. Those that had to engage in more interactions with *Facebook* also experienced less positive affect after the DT condition.

The findings support Green and Brock's (2000) claim that concentration and focused attention are crucial for the enjoyment of TV episodes. Their Transportation Theory claims that entertainment media allow people the opportunity to immerse themselves in a world of interesting characters and situations where they can at least temporarily leave behind their daily concerns. This is characteristic of many activities that people enjoy including video games (Faiola, Newlon, Pfaff, & Smyslova, 2013). Although these often require considerable multi-tasking, the various tasks are typically well integrated, serving the common goal of enhancing performance in the game (Chiappe, Conger, Liao, Caldwell, & Vu, 2013). Distractions and shifts of attention to unrelated tasks break the spell and prevent people from becoming absorbed in the world of the narrative.

Although watching the episodes under ST conditions yields greatest enjoyment, we also found that it produces more hedonic adaptation than watching episodes under DT conditions. This is supported by the fact that when the ST condition was done first, the DT condition that followed tended to receive lower enjoyment and engagingness ratings than when the DT condition had been done first. In contrast, starting with the DT condition did not compromise the subsequent enjoyment and engagingness of the ST episode, as the ST condition was not enjoyed less when it came second. These results, like those that have examined the effect of commercial interruptions on the enjoyment of TV episodes, show that hedonic adaptation can take place when people watch TV programs (Nelson et al., 2009). They also suggest that for this to take place it requires the degree of absorption in the TV episode afforded by the ST condition.

Our findings contrast with research examining effects of multi-tasking on the reception of advertisements (Chinchanachokchai et al., 2015; Shapiro & Krishnan, 2001; Voorfeld, 2011; Yoon et al., 2011). Several studies have found that multi-tasking actually increases overall enjoyment as well as positive evaluations of the ads, though it can negatively affect explicit memory of the products. In the case of ads, Wang and Tchernev's (2012) claim that media multi-tasking sacrifices cognitive needs in order to satisfy emotional needs, such as needs for enjoyment, may be true, but was not the case for the TV episodes in our study, where media multi-tasking compromised not just the encoding of information about the episodes, but also their enjoyment.

The results also failed to support the possibility that although people may enjoy the episodes less under DT conditions that they have an overall better mood as a result of interacting with *Facebook* while watching the episodes. This would represent a rational trade-off, because they would be sacrificing enjoyment of one task for the sake of improving their overall hedonic state by adding a second task. We found no evidence for this, as the DT condition led to more negative affect. It also lowered positive affect when

people had to do a greater amount of interaction with *Facebook* in Experiment 2.

There are several explanations for why media multi-tasking in our study yielded a worsened mood. First, although multi-tasking can improve mood and enjoyment of tasks when a person is under-stimulated, it can increase feelings of stress and frustration when a person is engaged in tasks that are demanding of attentional resources (Chinchanchokchai et al., 2015). In the present study, processing the content of the TV episodes and carrying out the *Facebook* tasks would certainly have placed considerable demands on the limited processing resources of participants, and they may have found it difficult to accomplish both. Second, participants may have experienced greater negative affect in the DT condition due to the fact that they enjoyed the TV episodes less under that condition. They may have found it frustrating not to be allowed to become immersed in the narrative by being prompted to interact with *Facebook*. Third, the increased negative affect could have resulted from being reminded of all the other things they could be doing, something that is salient in social media sites as people often post about interesting and enjoyable activities. On this view, the culprit is the greater awareness of opportunity costs that can become evident to participants as they interact with *Facebook*. Opportunity costs, which refer to the desirable features of the options we forgo, detract from the enjoyment of the chosen activities. The more options there are, the greater the opportunity costs, and the less satisfaction and enjoyment people derive from their current activities (Schwartz, 2004). Our findings do not allow us to choose between these accounts, but the outcome is the same; interacting with *Facebook* while engaging entertainment media does not increase overall mood, or boost enjoyment, but can actually yield greater negative affect.

These findings may help to shed at least partial light on why others have found a relation between media multi-tasking and psychological well-being (e.g., Rideout et al., 2010). A study by Becker, Alzahabi, and Hopwood (2013), for example, found that higher media multi-tasking was predictive of greater symptoms of depression and anxiety. This is the case even after controlling for overall media consumption, as well as neuroticism and extraversion personality characteristics. The authors state that “the growing trend of multi-tasking with media may represent a unique risk factor for mental health problems” (Becker et al., 2013, p. 132). If people habitually distract themselves while engaging in activities that are meant to yield enjoyment, and this yields greater negative affect, it is not difficult to conceive how this could increase the likelihood of a person developing an affective disorder. After all, there are limited opportunities for enjoyment each day, and compromising these activities by media multi-tasking can lead to a situation where a person has enjoyed very few of the activities they took part in. Of course, there are likely to be many other factors that also account for the link between well-being and media multi-tasking. For example, Pea et al. (2012) found that media multi-tasking was associated with lower social success, lower feelings of normalcy and with sleeping less among 8–12 year old girls, results that are not readily explained by our finding increased negative affect following media multi-tasking with *Facebook*.

In addition to showing that media multi-tasking can compromise mood and enjoyment of TV episodes we also found that it can prevent encoding of details about these shows, as people recalled more details about the episodes under ST conditions, and this was particularly evident among participants who reported being frequent *Facebook* multi-taskers. There are several potential explanations for this. One is that the habitual media multi-taskers had greater difficulties shifting attention between the *Facebook* task and the TV episode. When shifting back to the episode, for example, they may have continued to think about their *Facebook* page rather than disengaging from it so that they could focus on

encoding the episode. This would be consistent with research by Ophir et al. (2009) who found that people that are frequent media multi-taskers display greater shifting costs.

A second explanation is that habitual media multi-taskers may have an information-processing bias in favor of breadth. Rather than focusing on particular pieces of information, they may prefer to cast a wider net and process greater amounts of information, even information that is not directly relevant to the task at hand (Lin, 2009; Ophir et al., 2009). Thus, they may use a broader band attentional filter when selecting information, processing the information less thoroughly as a result. A consequence is that they are likely to perform worse on tasks that require focused attention. A breadth bias can be beneficial, however, in situations that require sensitivity to novelty in the environment. As Ophir et al. (2009, p. 15585) claim, “they may be sacrificing performance on the primary task to let in other sources of information.” This bias toward breadth and less-focused attention is also consistent with Ralph et al.’s (2014) finding that high media multi-tasking individuals reported more spontaneous and deliberate mind wandering in daily life, which presumably occurred also while people were engaged in tasks that they enjoyed.

A third explanation for the results is that the high *Facebook* multi-taskers were simply more interested in the content of their *Facebook* page. If so, they would have paid more attention to it under DT conditions than those who are less habitual multi-taskers, leading to relatively worse memory performance. This view does not impugn the task-switching attentional abilities of these participants as does the first explanation, and it makes no claims about the breadth bias of the participants that habitually media multi-task, as does the second explanation. The account is also consistent with the enjoyment results, as the habitual *Facebook* multi-taskers would also be likely to enjoy watching the episodes more under ST conditions than under DT conditions, because under DT conditions the episodes would detract from their enjoyment of interacting with *Facebook*.

There are, therefore, several explanations for our finding that high *Facebook* multi-tasking individuals were particularly likely to see benefits in their memory performance under ST conditions. We cannot, however, rule any of these out. Regarding the task-switching account, our paradigm did not measure task-switching costs, so we cannot provide strong support for this view. Moreover, as noted above, not all studies have found that frequent media multi-taskers are worse at task switching (e.g., Alzahabi & Becker, 2013; Minear et al., 2013; Ralph et al., 2015). With respect to the breadth bias account, the present studies did not measure whether our high and low media multi-tasking participants differed in their information processing biases. Finally, we do not know whether the high media multi-tasking participants were more interested in their *Facebook* pages under DT conditions. Future studies will have to address these issues.

5. Conclusion

The present study examined the consequences of multi-tasking with *Facebook* while watching TV episodes. People enjoyed episodes more and remembered more about them when they did not engage in media multi-tasking. Moreover, the benefits of the ST condition over the DT condition were particularly evident for those who had to interact with *Facebook* more often during the study, and for those who reported multi-tasking with *Facebook* regularly outside the experiment. Our findings are consistent with much of the literature examining effects of media multi-tasking in academic contexts. Our results are noteworthy, however, for demonstrating effects of media multi-tasking on a task that requires people to process entertainment media – watching TV

sitcoms. This is an activity that people readily seek out and are increasingly sabotaging by introducing distractions in the form of alternative media sources.

Appendix

Sample quiz for one episode of the show *Scrubs*.

1. According to what is revealed in the episode, why was Dr. Cox suspended?
 - a. It was found that he ordered many unnecessary tests.
 - b. Because he yells too much at the interns.
 - c. He failed to order a test and a patient died.
 - d. It was never explicitly stated in this episode.
2. According to J.D., what is the worst part about being an intern?
 - a. Dealing with death.
 - b. Disimpacting many bowels every week.
 - c. Stress.
 - d. Long hours.
3. What was the profession of the patient whose jaw was wired shut?
 - a. Psychiatrist.
 - b. A tightrope walker.
 - c. Family doctor.
 - d. Ear, nose and throat (ENT) doctor.
4. Who said “Don’t look her in the eyes, she’ll steal your soul”?
 - a. Dr. Turk, about Carla.
 - b. Dr. Kelso, about Jordan.
 - c. J.D., about Jordan.
 - d. Dr. Cox, about Jordan.
5. What did Carla’s mom break and where?
 - a. Her arm, in the shower.
 - b. Her leg, on the stairs.
 - c. Her leg, in the shower.
 - d. Her hip, on the stairs.
6. In their exchange, Carla accuses Dr. Cox of having?
 - a. Crazy eyes.
 - b. Crazy hair.
 - c. Scary hands.
 - d. Funny ears.
7. Half way through the episode, what is JD’s main discovery about his patient Jordan?
 - a. That she is a board member.
 - b. That she was married to Dr. Cox.
 - c. That she is really nice deep down inside.
 - d. That she is very ill.
8. What does Jordan make fun of Dr. Cox about?
 - a. Being sloppy in his work.
 - b. Not having a social life.
 - c. Being a lousy lover.
 - d. All of the above.
9. According to Dr. Cox what does Carla use her mom for?
 - a. As an excuse not to take chances.
 - b. As an excuse not to listen to other people.
 - c. To get back at her boyfriend whenever he does something wrong.
 - d. All of the above.
10. What did JD learn from his experience this episode?
 - a. That people need someone to listen to them.
 - b. That every ending leads to new problems.
 - c. That it is important to spy on people during their alone time.
 - d. That it is important to take chances.

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