SUPPLEMENTARY MATERIALS
The Psychology of Getting Busy: Multitasking as a Consequence of Goal Activation

STUDY 1B

The aim of the study was to replicate the results of Study 1A on a different sample and with a slight change in the procedure: instead of asking participants to identify the tasks they perform on their typical day, we asked them to identify the tasks they needed to perform on the day of the study (i.e. *today*). We did so to control for the possibility that for some participants their typical tasks were not the same as those they planned for the day of the study. Also, for exploratory purposes we added an open-ended question in which we explicitly asked participants to describe situations in which they typically multitask.

Participants

We aimed to recruit a sample of the size at least as large as in Study 1A and posted announcements on local social portals in which we invited volunteers to take part in a short online study on planning for a monetary compensation equivalent to $1.3. Two-hundred and twenty-five participants responded and took part in the study. Participants were 181 women and 42 men (2 did not indicate their gender) aged between 18-40 (M = 21.82, SD = 3.92). Participants who did not follow the instructions (they did not plan any tasks or described several tasks as if they were one) as well as those who completed the study outside of the required time window (see the Procedure section) were excluded. The final sample comprised 173 participants (141 women) with the mean of age M = 21.84 (SD = 3.94). All participants provided online informed consent for participation in the study. The research was approved by the local Research Ethics Committee.

Procedure

Participants followed a similar procedure to that of Study 1. They were first asked to identify up to 10 tasks. This time, however, we asked them to name the tasks that they needed to perform *today*, that is on the day of the study, rather than the tasks they typically perform (to avoid a situation in which one's typical tasks could not make it to the today's plan, for whatever reason). After identifying the tasks, participants completed the same *Plan-Your-Day* procedure as in the previous study. Since they planned the rest of their day, it was important that they do not perform the planning task too late. Therefore, they were asked to complete the study before 2 p.m. the latest (those who participated in the study outside of that time window were excluded). Having completed the planning task, participants were asked to answer an open-ended question on when they typically multitask (i.e. perform several simultaneous tasks or switch between them). This was done to obtain their *spontaneous* responses as to when they resort to multitasking most often in their everyday lives.

Results and discussion

On average, participants identified M = 8.02 (SD = 2.13) tasks with M = 7.99 (SD = 2.14) being included in their subsequent plans. Out of the 12 hours available for planning, an average of M = 7.60 (SD = 2.16) hours were planned. Task indices are presented in Table 1A.

Table 1A
Descriptive statistics for variables measured in Study 1B (N = 173).

	Study 1B	
	M	*SD*
Total number of blocks	8.74	2.83
Mean block duration	69.61	36.06
Mean number of blocks per task	1.10	0.19
Overlapping blocks [no.]	3.02	2.88
Overlapping blocks [%]	31.72	26.90
Time of overlap [min.]	76.99	103.16
Time of overlap [%]	15.43	18.16

To test our predictions, like in Study 1A, we calculated percentage bend correlations between the number of activated goals (tasks identified) and the multitasking indices obtained from the planning task. In line with our predictions and similar to the results of Study 1, the number of identified tasks correlated negatively with the average block duration, ρ_{pb} = -.18, p = .019, and positively with the number of overlapping blocks, ρ_{pb} = .454, p < .001, as well as the amount of time in which two or more tasks overlapped, ρ_{pb} = .40, p < .001. The correlations with the percentage measures were significant too and they were equal to ρ_{pb} = .38, p < .001, for the percentage of overlapping blocks and ρ_{pb} = .38, p < .001, for the percentage of overlapping times. The results stayed the same when we filtered out those who included only one task in their plan (only 2 participants did so, remaining N = 171). Respective correlations were equal to ρ_{pb} = -.18, p = .017 for average block duration, ρ_{pb} = .53, p < .001, for the number of overlapping blocks, ρ_{pb} = .36, p < .001, for the percentage of overlapping blocks, and ρ_{pb} = .39, p < .001 for the number and ρ_{pb} = .37, p < .001, for the percentage of the time two or more tasks overlapped.

The results thus show that the more active task goals, the greater the propensity to multitask, as expressed by the shorter time blocks, greater number of overlapping blocks and more time in which two or more tasks overlapped. The results are thus in line with the results of Study 1 and like in the previous study, they do not merely stem from the fact that the more tasks one has, the more they need to "squeeze" them into their plans. We obtained significant results for the percentage measures which indicate the number of overlapping blocks or overlapping times *relative* to all blocks or the total "busy" time, respectively. This suggests that with an increasing number of goals, participants deliberately planned more of their tasks in a multitasking manner. This is in line with what participants answered when asked *when* they typically multitask (see the analysis below).

When people multitask: Answers to an open-ended question

Participants in Study 1B were asked a question: *When do you typically multitask (i.e. perform several tasks at the same time or switch between them)?* to which they were asked to provide a short open-ended answer. Out of 225 participants, 211 provided an answer to this question. The answers were then categorized into one of the several categories presented in Table 1. Some of the participants provided longer answers which were coded into two categories. This resulted in 246 answers in total.

Categories were created in a bottom-up fashion (a new category was added whenever a given answer did not fit into any of the existing ones). This resulted in 7 categories (the least frequent ones were merged into the "other" category). Each answer was coded by two independent coders. Any disagreements were discussed and resolved, so that one or two final categories was ascribed to each answer. One of the categories was "frequency" which related to instances in which participants reported *how often* instead of *when* or in *what situations* they multitasked. This category, as not informative, was excluded.

As presented in Table 1, the category that appeared most frequently was "when have a lot of tasks" in which all responses wherein participants explicitly mentioned having too many tasks, chores, etc. were included. Some of the participants also specified that it was the of combination of having too many tasks and too little time that made them multitask (there was also a separate category pertaining to having too little time). Other responses pertained to specific situations (such as being at work, at home etc.), specific times of the day or week or when one needed a break or distraction from a current tasks (akin to self-interruptions). There was also a category which pertained to task characteristics ("when the tasks allow it") in which participants mentioned difficulty or complexity of the tasks or the extent to which it is easy to combine it with other tasks.

Table 1B

Categories of situations which participants provided when answering the question about when they typically multitask with sample answers

	frequency
when have a lot of tasks (and too little time) *e.g. when I have too little time and there are many tasks to perform, when there are many important matters to deal with and not enough time, when I have too much on my plate, when I have too many chores*	59[a]
when in a given situation *e.g. during the exam session, when at work or at the university, only while cooking, at work*	47[b]
when the tasks allow it *e.g. when the tasks do not require too much of my attention, when I have to deal with simple activities, when the tasks do not require my full focus, when I can combine cognitive and physical work*	29
at a given time of the day/week *e.g., in the mornings, in the evenings, before work, during weekends, from Monday to Friday*	28
when need a break/distraction *e.g. when one of the tasks is boring, when the task is demanding and I need a break, during a boring lecture when I need a break, when I do not have enough to do*	16
when have too little time *e.g. when I have not enough time, when deadlines approach, when I am in a hurry to finish everything before deadlines*	12
Other *e.g. it depends, when needed, whenever I switch between tasks*	8

[a] 19 of participants explicitly mentioned having too many tasks in combination with having too little time
[b] A large sub-category (9 answers) pertained to the exam session which might also be indicative of having too many (academic) tasks

MANIPULATION CHECKS FOR STUDY 2

In order to check whether our importance manipulation was effective, we checked the differences in ratings of the importance of different tasks. The results showed that the average importance of performing well on the mathematical tasks was $M = 4.41$ ($SD = 1.91$) in the control and $M = 6.24$ ($SD = 0.79$) in the increased importance condition. As indicated by one-way ANOVA results, this difference was statistically significant, $F(1,186) = 72.68$, $p < .001$. Thus, in line with our manipulation, participants in the increased importance condition treated performance on the mathematical task as more important, and performance on the monitoring task and the letter tasks as less important. Respective means for the monitoring task were $M = 4.61$ ($SD = 1.58$) in the control condition and $M = 1.54$ ($SD = 1.48$) in the increased importance condition; this difference was significant at $F(1,186) = 86.05$, $p < .001$. Respective means for the letter task were $M = 5.11$ ($SD = 1.90$) in the control condition and $M = 3.97$ ($SD = 2.09$) in the increased importance condition; this difference too was significant $F(1,186) = 15.57$, $p < .001$. The results thus indicate that participants in the increased importance condition treated performance on the mathematical task as more important and performance on the other two tasks as less important.

Additionally, we ran a repeated measures ANOVA on the ratings of the importance of the three tasks and a between-subject factor of condition. We expected more balanced ratings of importance in the control (equal importance) condition than in the increased importance condition. ANOVA results showed a main effect of condition, $F(1, 186) = 10.74$, $p < .001$, a main effect of task, $F(1, 372) = 50.43$, $p < .001$, and a significant interaction, $F(1, 372) = 68.81$, $p < .001$. The latter suggests that whereas the differences in importance ratings were non-significant in the control condition (except for the difference between the mathematical task and the letter task, which was significant at $p = .046$), they were significant in the increased importance condition (with all differences significant at $p < .001$). The means in the control condition were $M = 4.41$, $M = 4.61$, and $M = 5.11$, for the mathematical, monitoring and letter tasks, respectively. The means in the increased importance condition were $M = 6.24$, $M = 2.54$, and $M = 3.97$, for the mathematical, monitoring and letter tasks, respectively. Thus, participants in the control condition rated the tasks as similarly important, whereas importance ratings significantly differed in the increased importance condition.

The results for performance measures followed a similar pattern as participants in the increased importance condition had much higher performance on the mathematical task than participants in the control condition. Their performance on the other two tasks, however, was significantly lower (results for performance are described below).

PILOT STUDY ON PHONE USE IN CLASS

Participants

Forty-six students (36 female, 10 male) took part in the pilot study. They were aged between 19 and 37 with the mean of age *M* = 22.04 (*SD* = 3.88). They were invited to the laboratory to take part in a study in which they were asked to solve a short (taking 5-7 minutes) cognitive task. After having completed the task, they were asked to take part in another study on mobile phone use during class. They were compensated with equivalent of $4 for participation in both studies. The procedure was carried out in accordance with the recommendations of the local Faculty Ethics Committee with written informed consent from all subjects

Method

Participants were first asked how often they used their mobile phones during class (responses were given on a 1-7 Likert scale from "never" to "(almost) always"). Then, they were asked to indicate the goals/activities related to their in-class phone use. Specifically, we instructed them to indicate from 2 to 5 activities they perform with their phones during class or goals these activities serve. In reference to each goal/activity they had indicated, we asked the following questions: 1) *Is this activity related to your participation in class or not (i.e. it serves another goal)?* (responses given on 1-7 scale from „definitely related to the class" to „definitely related to another goal") and 2) *To what extent does this goal/activity helps and to what extent it hinders your participation in class?* (responses on a -5 to 5 scale, where -5 indicates "definitely hinders", 0 "does not affect class participation", and 5 "definitely helps"). At the end, participants were asked basic demographic questions (age and gender) and thanked for their participation in the study.

Results

The mean phone use reported in the study was equal to *M* = 4.80 (*SD* = 1.57), which indicates rather frequent use (7 was the maximum point on the scale). In line with our instructions, each participant indicated at least two phone-related activities with most indicating more: 18 participants indicated 5 activities, 14 indicated 4, 9 indicated 3 and 5 participants indicated 2 activities. On average, participants indicated *M* = 3.89 activities (*SD* = 1.02); there were 193 activities provided in total.

To analyze the goals/activities indicated by our participants, we categorized them in several categories presented in Table 2. The results suggest that there were more categories and individual activities unrelated to class (and related to other goals) than class-related categories and activities. The relation to class assessment was based on participants' ratings with lower scores indicating relation to class and higher indicating relation to other goals (see Table 2 for means and standard deviations for each category). As seen in the table, the mean for activities related to other goals is equal to *M* = 5.87 and mean for activities related to class to *M* = 1.49. Not surprisingly, all activities related to other goals had a negative perceived impact on class (average ratings below 0, the only exception is "checking the time" which was rated as having minimal impact on class – score close to 0). Activities related to class got positive scores, which indicates that participants perceived them as facilitating their class-related goal.

Table 2

Categories of activities participants use their mobile phones for: frequency, rated relation to other goals (the higher the score, the greater relation to other goals) and rated impact on class with negative scores indicating negative impact and positive scored indicating facilitating impact.

Activity	frequency	Relation to class/other goals		Impacting class	
		M	*SD*	*M*	*SD*
Related to other goals					
texting, messaging, contacting friends	34	5.94	1.75	-2.76	1.70
checking social media	32	6.16	1.65	-2.88	1.66
reading/sending email	13	4.31	1.55	-0.85	1.41
playing games	11	6.82	0.40	-2.91	1.87
browsing the net to "kill time"	7	6.43	1.13	-2.57	2.57
checking the time	6	4.67	1.03	0.17	0.41
looking up news or the weather	5	5.40	1.14	-2.60	2.41
learning for another class	4	6.50	1.00	-3.00	0.82
browsing/taking photos	2	5.50	2.12	-3.50	2.12
taking/making phone calls	2	7.00	0.00	-3.00	2.83
taking/reading notes for other than class purposes	2	6.00	1.41	-1.00	0.00
Total	**118**	**5.87**	**1.61**	**-2.42**	**1.88**
Related to class					
looking up words, facts and materials related to class	29	1.41	1.15	3.00	2.25
taking/reading notes for class	14	1.57	1.60	2.71	1.94
accessing online class resources	10	1.10	0.32	4.30	1.57
taking photos of slides or other class resources	8	1.38	0.74	2.75	3.01
using phone apps (calendar, calculator, maps etc.)[a]	4	3.00	2.71	1.50	2.65
Total	**65**	**1.49**	**1.30**	**3.02**	**2.25**

[a] This category is ambiguous as it might serve class purposes (as in case of a calculator) as well as other purposes (as in case of maps and transportation apps). However, it was included in the category of activities related to class as the average rated relation to class was equal to 3 which is below 3.5 (the midpoint of the scale).

Additionally, we checked whether there were any participants who reported using mobile phone in class *solely* for the purposes related to their class participation. It turned out that there was no such a participant and on average participants indicated M = 2.39 (SD = 0.88) activities related to other than class goals. Further, for each participant we calculated the proportion of activities related to other than class goals (out of all activities indicated). It turned out that on average *M* = 60.54% (*SD* = 19.70%) of activities indicated were related to other goals.

The results thus demonstrate that majority of in-class phone use serves purposes which are not related to one’s participation in class. And even though phones are also used to facilitate class participation (e.g. to take notes, look up class-related information), they also promote off-task multitasking (each participant indicated using phone for at least one off-task activity).

Study 6B
Testing the relationship between reported goal importance and the likelihood of multitasking

The aim of this study was to provide further evidence that goal importance shields the main task from distraction and reduces multitasking. In the study, we activated one of participants' everyday goal (referred to as the main goal) and two additional goals (referred to as alternative goals). We then asked participants to think of the main task and rate the likelihood of them combining this task with alternative tasks or switching/dividing attention between the tasks. We thus measured the likelihood of multitasking and expected that the more important the main goal, the lesser the likelihood of multitasking.

Participants

Based on power analysis[1] we recruited 129 participants (104 women, 25 men) of minimum high school education to take part in a lab experiment. Participants were young adults aged between 18 and 40 years (M = 21.72, SD = 3.83). Since the current experiment was very short, after having finished it, participants took part in another short study and were compensated for participation in both (with an equivalent of about $3). The study was carried out in accordance with the recommendations of the local Faculty Ethics Committee with written informed consent from all subjects.

Materials and Procedure

Participants were first asked to indicate a task or an activity they perform in their typical day. Then, they were asked to rate the importance of completing the task/performing the activity on 1-7 Likert scale (from *definitely not important* to *definitely important*) and provide a brief explanation why they find it important. Next, they were asked to name two other tasks/activities they also perform in their typical day and shortly describe them. This way we wanted to make sure that all participants had several active tasks goals in mind (the main one, indicated at the beginning, and two alternative ones).

Then, we asked participants to think about the main task they indicated at the beginning of the study (it was also displayed on the computer screen) and asked them to answer a set of questions measuring likelihood of engaging in multitasking. Specifically, we asked participants how likely it was that during their performance of this (main) task they would: 1) perform this task in combination with other tasks/activities; 2) focus solely on this task (inversed item); 3) if possible, join it with other tasks/activities, 4) work on this task, then on another task, and then again on this one etc.; and 5) split their attention between this and other tasks. Answers to all five questions were provided on a 1-7 Likert scale (from *definitely unlikely* to *very likely*). Responses to all question were averaged and an index of likelihood of engaging in multitasking was created (Cronbach α = .83).

Results

Descriptive statistics for importance of the main activity as well as multitasking items are presented in Table 5. To test our hypotheses, we analyzed correlations between the importance of the main task and reported likelihood of engaging in alternative activities. If

[1] A power analysis for a correlation of ρ = .30 showed that a sample of at least 112 participants would be necessary to obtain the power of .90. In case of any data losses, we aimed to recruit minimum 125 participants.

goal importance indeed shields the main task from distraction, it should be negatively correlated with the likelihood of engaging in alternative activities while performing the task

Indeed, this is what the case. There was a significant negative correlation of $r = -.27$, $p = .002$ between the importance of the main activity and the likelihood of multitasking. Also the correlations with individual indices were in the expected direction (see Table 5).

Table 3

*Descriptive statistics for variables measured in Study 6B and correlations of multitasking items with main task importance (*N *= 129)*

	M	*SD*	*r*
Main task importance	5.74	1.04	
Likelihood of:			
1. combining the main task with alternative tasks	4.16	2.03	-.21*
2. focusing solely on the main task [a]	4.81	1.86	.31***
3. joining the task with alternative tasks	4.36	1.91	-.17*
4. switching between the main and alternative tasks	4.45	2.03	-.15
5. splitting attention between the main task and alternative tasks	4.21	1.92	-.19*
Multitasking index	4.07	1.51	-.27**

* $p < .06$ ** $p < .01$ *** $p < .001$

[a] Before calculating the multitasking index the response to this question was recoded.

STUDY 6
Supplementary tables

Table 4
Sequence of models tested in Study 6 (N = 131).

	Null model	Fixed effects model	Random effects model	Random effects model + covariate
Fixed part				
Intercept	3.21***	3.22***	3.25***	3.25***
Importance		-0.21***	-0.23***	-0.23***
Difficulty				-0.02
Random part				
σ^2	1.85	1.78	1.55	1.40
τ_{00}	1.43	1.42	4.74	3.44
τ_{11}			0.15	0.13
$r_{intercept, slope}$			-.86	-.91
Deviance	2458.61	2435.18	2411.04	2399.56

σ^2 – variance of level-1 error terms, τ_{00} – variance of random intercepts, τ_{11} – variance of random slopes

Results of multiple regressions for each class separately

Table 5
Regression coefficients for models predicting phone use in each of five classes.

	b	SE	*t*	*p*
Class 1				
Intercept	3.75	0.67	5.56	<.001
Importance	-0.27	0.11	-2.33	.021
Difficulty	0.18	0.11	1.71	.089
Class 2				
Intercept	5.65	0.76	7.41	<.001
Importance	-0.43	0.13	-3.38	<.001
Difficulty	0.00	0.11	0.00	.997
Class 3				
Intercept	3.81	0.67	5.71	<.001
Importance	-0.10	0.12	-0.77	.439
Difficulty	0.01	0.11	0.05	.957
Class 4				
Intercept	5.21	0.63	8.22	<.001
Importance	-0.30	0.12	-2.60	.011
Difficulty	-0.09	0.10	-0.91	.365
Class 5				
Intercept	3.54	0.46	7.64	<.001
Importance	-0.31	0.11	-2.72	.007
Difficulty	0.32	0.12	2.78	.006

RESULTS AND DISCUSSION OF TASK PERFORMANCE

In the set of studies presented in the main article, we have focused on the degree of multitasking, i.e., the extent to which people engage in task switching or simultaneous task execution. This, however, is a different question than a question about performance. Many studies from the area of cognitive psychology as well as from more applied settings (e.g. studies on driving or performance in emergency rooms) show that multitasking is associated with reduced performance and increased performance costs (see Courage et al., 2015; Monsell, 2003; Pashler, 1994; Salvucci & Taatgen, 2011, for overviews). This, however, is not always the case as positive as well as curvilinear effects have been reported (Adler & Benbunan-Fich, 2012; Kc, 2014). The relationship thus depends on the tasks involved (e.g., their difficulty, length, similarity), the aspect of performance analyzed (e.g., speed, accuracy, creativity, efficiency, Adler & Benbunan-Fich, 2012), or the time of switching (Iqbal & Bailey, 2005). Studies show for instance that whereas interruptions hinder performance on complex tasks, they might facilitate performance on simple tasks, especially in terms of performance speed (Drews & Musters, 2015; Speier et al., 1999, 2003). Speier et al. (2003) argue that this stimulating effect of interruptions might be due to the additional demands they pose which – by making the performance situation more difficult – further motivate a person to dedicate their full attention and processing capabilities to performing the task at hand.

A similar picture of a complex and rather mixed relationship between multitasking and performance emerges from our data. For studies in which we measured performance (Studies 2, 3, & 4) we tested differences between conditions as well as correlations with the degree of multitasking. The results are presented below.

Study 2

Table 4 presents descriptive statistics for the indices of performance in tasks used in Study 2. For each index, we tested a difference between the control and goal activation condition. The results are presented in the last column of the table: *p* values for a test of a difference between the means (independent samples *t*-test was used) and medians (bootstrapping method was used to determine *p* values, *WSR2* R package, Mair & Wilcox, 2015). The latter is presented in parentheses.

Table 6

Means, standard deviations and medians for the measures of performance on tasks participants performed in Study 2.

	Control condition			**Goal activation condition**			**Significance**
Task	*M*	*SD*	median	*M*	*SD*	median	**of a difference [*p*]**
Sudoku [no. of correct answers]	61.41	19.11	65.5	58.45	19.72	53.5	.38(.32)
Points in the air hockey game [a]	5.41	6.78	4.0	6.40	7.38	4.0	.43(.70)
Article: no. of correct answers	2.56	1.30	3.0	2.52	1.28	2.0	.85(.37)
Video: no. of correct answers	2.41	1.53	2.0	2.16	1.32	2.0	.30(.78)

Radio broadcast: no. of correct answers	2.76	1.15	3.0	2.38	1.20	2.0	.06(.20)

[a] The score is a difference between the number of goals scored by the participant and goals scored by the computer (the greater the number, the more participants' goals compared to the computer's goals).

The above results show that there were no differences in performance between the two conditions. The only exception was a trend for the number of correct responses in questions from the radio broadcast. Participants in the control condition tended to score better than those in the goal activation condition (in which they switched more between the tasks). This might suggest that participants focused less on the radio broadcast (and thus remembered less information) in the condition in which they had more active goals.

The results, however, should be treated with caution. The effect has not reached the statistical significance level and the comparison test for overall differences between conditions (not for differences *after* the manipulation). The latter was not possible as participants could perform the tasks in the order of their choosing and had the freedom as to whether and how often switch between them (in the time window before the manipulation participants could have performed different sets of tasks).

Correlations with the number of switches

Besides testing the difference between conditions, we also checked whether the number of switches was related to the indices of task performance. We thus calculated percentage-bend correlations, ρ_{pb}, between the number of switches and indices of performance on each task. The correlations were following: $\rho_{pb} = .17$, $p = .045$, for the number of correct answers in the Sudoku puzzle; $\rho_{pb} = .08$, $p = ns.$, for the number of points from the air hockey game; $\rho_{pb} = .00$, $p = ns.$, for the number of correctly answered questions from the article; $\rho_{pb} = -.20$, $p = .021$, for the number of correctly answered questions from the video; and $\rho_{pb} = -.13$, $p = .127$, for the number of correctly answered questions from the radio broadcast.

These results suggest a differential relationship between the number of switches and performance indices. Whereas there were no effects for performance in the game, questions from the article and broadcast, there was a *positive* effect on performance in the Sudoku puzzle and *negative* for questions from the video.

Study 3

In Study 3, we analyzed the differences in performance between low and high interruption conditions. Descriptive statistics for the main indices of performance (the number of points and number of completed tasks) are presented in Table 5. For each variable, we present the total score as well as the scores for difficult and easy tasks separately.

Table 7
Descriptive statistics (means, standard deviations and medians) for measures of performance in the multiple task paradigm and their correlations with the number of responses to interruptions (Study 3, N *= 60).*

	Low interruption condition			**High interruption condition**			**Correlations with interruptions**	
	M	*SD*	*median*	*M*	*SD*	*median*	ρ_{pb}	*p*
No. of points: Total	52.06	16.50	49.40	54.98	17.39	55.10	.12	.366
No. of points: Difficult tasks	30.70	19.18	25.20	33.12	17.96	27.30	-.001	.995
No. of points: Easy tasks	21.36	8.82	19.80	21.86	10.99	20.40	.27	.039
No. of completed tasks: Total	13.46	3.07	14.00	14.53	4.06	14.50	.28	.029
No. of completed tasks: Difficult	5.39	2.95	5.00	6.09	2.76	5.50	.04	.755
No. of completed tasks: Easy	8.07	3.22	7.50	8.44	3.94	8.50	.26	.049

To test for differences between conditions, we run independent sample *t* tests on performance variables. The results showed no differences between conditions for the number of points (either total or broken down into difficult and easy tasks separately, in each case $|t| < 1$). The same was the case for the number of completed tasks (in each case $|t| < 1.16$). The results thus indicate no significant differences between conditions.

Correlations with the number of responses to interruptions

We checked, however, correlations with the number of responses to the interruptions (i.e. the degree of multitasking). Table 5 presents coefficients and *p* values for percentage-bend correlations, ρ_{pb}. They indicate that although there was no significant relationship between the number of responses to interruptions and the total number of points earned and the number of points from the difficult tasks, there was a positive relationship between responses to interruptions and the number of points earned from easy tasks. There was also a significant correlation with the number of completed tasks, but it seemed to be driven by easy tasks (correlation with the number of difficult tasks was not significant).

These results thus suggest that although involvement in interruptions did not relate to performance in difficult tasks (and overall performance), it was related to better performance in easy tasks (as indicated by the number of points) and more easy tasks completed. This is in line with the findings indicating stimulating effect of interrupters on performance of easy tasks (Speier et al., 1999, 2003).

Study 4

We checked whether there were significant differences between the control and increased importance condition in performance of each of the three tasks. To that aim, we run Yuen's trimmed mean *t*-test (*WRS2* R package, Mair & Wilcox, 2015) for the number of correct responses in the mathematical task, the number of correct responses in the letter task and the number of errors in the monitoring task (errors are better indicator of performance in this task). Descriptive statistics for performance measures are presented in Table 5.

Table 8

*Mean, standard deviations and medians for measures of performance on each of the tasks used in Study 3 (*N *= 188)*

	Control condition			**Increased importance condition**		
	M	*SD*	*median*	*M*	*SD*	*median*
Mathematical task	25.33	9.94	25	119.84	40.22	117
Letter task	17.41	7.22	19	8.22	7.58	8
Monitoring task (errors)	33.6	64.86	4	82.63	89.37	43

For the verification task, the trimmed mean difference was equal to 92.45, which was significant at $p < .001$, $T_y = 18.79$, $df = 60.41$. Trimmed mean difference of -10.26 was also significant for the letter task, $T_y = 7.33$, $df = 105.29$, $p < .001$. Also, the number of errors in the monitoring task differed significantly between the two conditions, as the trimmed mean difference was equal to 54.55, $T_y = 3.80$, $df = 59.94$, $p = .003$.

The results thus indicate that participants in the increased importance condition had a significantly better performance on the mathematical task than participants in the control condition did. At the same time, they had poorer performance on the other two tasks, which suggests that the importance participants attached to each task was reflected in performance on these tasks.

Correlations with the number of switches

We also tested correlations between the number of switches and reported frequency of switching and performance on each task. The results showed significant correlations between both switching indices and task performance. The direction of these correlations differed, however, depending on a task.

Performance on the mathematical task (the number of correct verifications) was negatively associated with the number of switches, $\rho_{pb} = -.28$, $p < .001$, and reported frequency of switching, $\rho_{pb} = -.35$, $p < .001$. Performance on the searching task, however, was positively related to the number of switches, $\rho_{pb} = .68$, $p < .001$, and reported switching, $\rho_{pb} = .52$, $p < .001$. Similar was the case for the monitoring task with even stronger effects, $\rho_{pb} = -.78$, $p < .001$, for the number of switches and $\rho_{pb} = -.57$, $p < .001$, for reported switching (these are correlations for errors, therefore, the more switches, the fewer errors, i.e. better performance).

General Discussion

The above results indicate that although there were no differences between control and goal activation condition in Study 2 (except for a trend indicating poorer performance on the task related to the radio broadcast in the goal activation condition), there was a relationship with the number of switches (i.e. the degree of multitasking). Interestingly, the number of switches was *positively* related to performance on the Sudoku puzzle, but *negatively* to performance on the task related to watching video. In Study 3, we did not find differences in performance between conditions either. However, like in Study 2, the degree of multitasking (here indexed as the number of responses to interruptions) was positively related to performance on easy tasks (the more responses to interruptions, the more easy tasks completed and the more points from these tasks). The number of responses to interruptions was not related to the overall number of points or points from difficult tasks (however, disruptive effect of responses to interruptions on difficult tasks was found in other studies, Speier et al., 1999, 2003; Szumowska & Kossowska, 2017). In Study 4, we found significant differences between conditions, with significantly better performance on the mathematical (prioritized) task in the increased importance (vs. control) condition but with significantly poorer performance on the other two tasks (performance on the latter two tasks was better in the equal importance condition in which multitasking was greater). There were also significant correlations between performance indices and the number of switches and reported frequency of switching. Again, this correlation depended on a task. Performance on the verification task was negatively related to the number of switches and reported switching frequency whereas performance on the other two tasks was positively related to both switching indices. The above suggests that the relationship between multitasking and performance is complex and depends on the characteristics of the tasks involved.

It also depends on which performance metrics are used (speed, accuracy, originality, quality, e.g. of care by physicians, etc.) and whether performance on one task or aggregated performance on all tasks is taken into consideration. Classical studies from cognitive literature consistently show performance decrements when a task is combined with another task (as in divided attention paradigm) or when one switches between tasks (as in task switching paradigm, Monsell, 2003; Pashler, 1994; Posner, 1990). However, even when performance decrements in a single task are found, the aggregated performance on all tasks in a given time unit does not necessarily have to be poorer (and might be even enhanced, especially when the tasks are not demanding). Indeed, people multitask in order to maximize their efficiency in satisfying their goals in a given time. The latter, however, can also be an illusion of efficiency and productivity that multitasking creates (e.g. Sanbonmatsu et al., 2013). Therefore, more studies are needed to address the issue of performance, which is very important when considering situations in which people already multitask (we here tried to address the question of *why* they engage in multitasking in the first place).

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