



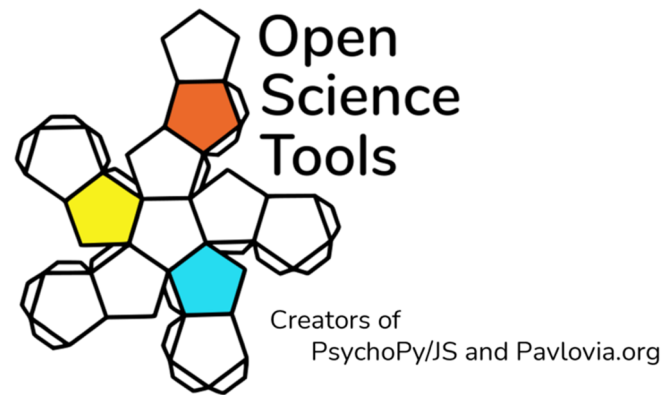
# HexKOP 22

54. HERBSTTREFFEN DER EXPERIMENTELLEN KOGNITIONSPSYCHOLOGIE

07.- 08.10.2022 UNIVERSITY OF GREIFSWALD



Special thanks to:



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# Programme



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Friday 07/10/2022

**09:00 Registration & coffee** – Festsaal

**10:00 Welcome!** – HS1

**10:15 Talk Session I** – HS1

10:15 Leif Erik Langsdorf | Reward effects in overlapping dual-task situations

10:35 Amelie Jung | How long can control states persevere? Applying the fade out paradigm to dual tasking

10:55 Daniel Damstaedt | Training-related improvements of task-order coordination in dual-task situations: On training and transfer effects

11:15 Viktoria Maydych | Effects of 18 hours fasting on task choice and performance in voluntary task switching paradigm with food stimuli

**11:45 Lunch Break** – Festsaal

**13:00 Talk Session II** – HS1

13:00 Valentin Koob | The role of task-relevant and task-irrelevant information in congruency sequence effects: Applying the Diffusion Model for Conflict Tasks

13:20 Maximilian Friehs | A touching advantage: investigating the influence of stop-signal modality on reactive response inhibition in the Stop-Signal Task

13:40 Ulrike Schwarz | Changing cognitive representations of food stimuli through the use of if-then plans in a Stop-Signal-Task

14:00 Robert Huber | Dissociating affective conflict and social intentions triggered by emotional facial expression of ingroup or outgroup members

**14:20 coffee & tea break** – Festsaal

**15:00 Poster Session I** – Festsaal  
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**16:30 open end until social events**

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Saturday 08/10/2022

**09:00 Arriving & snacks** – Festsaal

**10:00 Talk Session III** – HS 1

10:00 Paula Soballa | How landmarks influence tactile target localization

10:20 Sarah Koch | Investigating the vertical SMARC effect for loudness in a timbre discrimination task

10:40 Nicole Antes | Veracity and Memory: How metainformation about the veracity of information affects scene memory

11:00 Nadia Said | Understanding Sharing Behavior on Social Media Platforms: The Influence of Knowledge and Confidence

**11:30 coffee & tea break** – Festsaal

**11:50 Poster Session II** – Festsaal  
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**13:20 Lunch Break** – Festsaal

**14:30 Talk Session IV** – HS1

14:30 Nils Tobias Böer | The influence of effort instruction on passes with and without head fakes in basketball

14:50 Luisa Bogenschütz | Same, but different? Comparison of Signal-Detection Theory and Decision Diffusion Model

15:10 Silvia Selimi | Response-response binding with auditory stimuli

15:30 Lars-Michael Schöpfer | Less than the sum of its parts: Repeating a component of an event file does not retrieve the whole previous event

**16:00 Goodbye & open end until social events**



# Abstracts



# Posters I

## Language-dependent magnitude representations in different spatial dimensions: the role of inversion

Elena Sixtus<sup>1</sup>, Jan Lonnemann<sup>1</sup>, & Silke Göbel<sup>2</sup>

<sup>1</sup>University of Potsdam, <sup>2</sup>University of York

Number word inversion denotes the property of some languages where in spoken double-digit numbers the unit precedes the decade, although in written Arabic numbers the decade precedes the unit (e.g., in German 91 is “ein-und-neunzig”: “one-and-ninety” instead of “ninety-one” which follows the written order of decade and unit). An instance of the inversion effect is described by the finding that in ‘inverted’ languages like German, in number-to-position tasks on a number line, estimation errors are bigger than in a language without inversion property (like Italian or English) [Helmreich et al. (2011). Language effects on children’s nonverbal number line estimations. *Journal of cross-cultural psychology*, 42]. To date this has only been tested with relatively few double-digit numbers on a horizontally aligned number line in children. In the present preregistered study, we measure spatial representations on different dimensions in German and English adults with a larger number of double-digit numbers to determine if the inversion effect also appears in adults and in different spatial orientations. Participants mark positions corresponding to visually presented double-digit numbers on a 0-100 number line. In two blocks, this number line is presented horizontally and vertically on a tablet PC, and laterally and sagittally as a tape on the floor. Placing positions and response times are recorded. We specifically compare placing biases between English and German participants. Furthermore, for the first time we test whether number word inversion at the item level is driving the effect, by comparing inverted and non-inverted number words within one language (English, teens vs other double-digits, e.g. sixteen is inverted). The study therefore aims to give some indication of the effect that symbolic representations of numbers (i.e., number words) have on the mental representation of the underlying magnitudes.

## Reducing the flanker effect with a repeating sequence of conflict levels?

Eva Röttger<sup>1</sup>, Hilde Haider<sup>2</sup>, & Markus Janczyk<sup>1</sup>

<sup>1</sup>University of Bremen, <sup>2</sup>University of Cologne

In the Eriksen flanker task (Eriksen & Eriksen, 1974), the presence of irrelevant flanker stimuli, surrounding the target, induces response activation that can be either congruent or incongruent to the required response. As a result, responses are slower with incongruent than with congruent (or even neutral) flankers the flanker effect. Researchers have employed proportion congruency (PC) manipulations where the frequency with which irrelevant information conflicts with relevant information is varied. As a result, the flanker effect is smaller in contexts with high than with low proportions of conflict. It is assumed that during a learning phase, associations between features of the conflict-predicting context and the respective most frequently applied control-set are acquired. Encountering that context later again will then automatically activate the respective control set. In the present study, we investigated whether another form of context manipulation might lead to similar control adjustments. Across 6 blocks, incongruent (I), neutral (N), and congruent (C) trials occurred in a repeating 6-element sequence (e.g., C-N-C-I-N-I). We hypothesized that the participants incidentally learn this sequence so that, over time, the cognitive system might become similarly prepared for upcoming conflict as in a PC manipulation. As a result, the flanker effect should become smaller across the sequence blocks, but should increase again in a subsequent random block. One first (online) experiment (N = 32) provided mixed results. The hypothesized interactions were partially present in the error rates, but not in the RTs. Therefore, in a second (lab) experiment, we prolonged the learning phase and omitted neutral flankers to reduce the complexity of the sequence. Results are pending.



## **Individual Differences in Multitasking: Can Preferences for Parallel Versus Serial Processing be Influenced by Bottom-up Processes of Response Correspondence?**

Jovita Brüning

*Technical University Berlin*

Research on individual differences in multitasking has shown that humans either prefer a more serial or a more parallel mode of task processing, which can be assessed with the Task-Switching-With-Preview (TSWP) paradigm. It employs an alternating runs scheme with three repetitions per task (i.e., an AAABBB pattern) and allows but does not force individuals to pre-process the stimulus of an upcoming task switch. Individuals who pre-process the switch stimulus show fast switches, which are even faster than the average single-task performance. However, such fast switches only occur in 20-60% of all switch trials. This may suggest that a preferred parallel processing mode does not operate in an all-or-none fashion but is modulated by (potentially bottom-up) processes which vary from trial-to-trial. In the present study, the relevance of one such possible bottom-up effect is investigated in 48 participants by varying the compatibility of responses between the ongoing task sequence (e.g., AAA) and the upcoming switch stimulus (B). Three different correspondence conditions are realized: (1) full correspondence (i.e., the ongoing and upcoming task require the same responses, e.g., task A requires three “index finger” responses and task B also requires an “index finger” response) (2) partial correspondence (e.g., task A: “index finger”, “middle finger”, “index finger” and upcoming task B: “middle finger”) (3) no correspondence (i.e., both tasks require different responses). For individuals preferring a parallel processing mode, I predict the highest number of fast switches in full correspondence trials, and the lowest number of fast switches in no correspondence trials. The number of fast switches in the partial correspondence condition should be between these two conditions. As serial processors usually show almost no fast switches, I assume their performance to be unaffected by correspondence conditions. The data collection has just finished, and the first results will be presented at the conference.

## **The influence of free choice on recognition memory**

Kerstin Fröber<sup>1</sup> & Bernhard Pastötter<sup>2</sup>

*<sup>1</sup>University of Regensburg, <sup>2</sup>Trier University*

Several studies demonstrated a benefit in recognition memory for items learned under free-choice conditions compared to forced-choice conditions. In these studies to-be-remembered items were presented in isolation, but in many everyday situations learning material is presented in a context with many distractions. In the present study, we tested in two experiments the influence of free vs. forced choice on recognition memory in a learning situation with relevant (to-be-remembered) items presented together with irrelevant (to-be-ignored) items. Experiment 1 (N = 62) used compound word-picture stimuli and Experiment 2 (N = 59) a combination of written and spoken words. Prior to the presentation of the two stimuli, participants were either instructed which item to remember (forced choice) or could decide themselves (free choice). Results showed a superiority effect for pictures (Experiment 1) and spoken words (Experiment 2). More importantly, recognition memory was better for relevant items than irrelevant items and relevance interacted with choice: free choice improved recognition memory for relevant items only, but did not influence recognition memory for irrelevant items. That is, participants were able to selectively learn in the face of irrelevant distractions and having some control about the learning situation further improved memory specifically for relevant items. Applied to everyday learning, this suggests that self-directed learning is beneficial even in situations with irrelevant distraction and that free choice does not entail a non-specific advantage for both relevant and irrelevant items.





## **Separating bottom-up and top-down modulation effects of intentionality using an online joint Simon task with virtual co-acting hands**

Luke Bölling<sup>1</sup>, Christine Blech<sup>1</sup>, Cédric Bouquet<sup>2</sup>, & Roman Liepelt<sup>1</sup>

<sup>1</sup>*FernUniversität Hagen*, <sup>2</sup>*University of Poitiers*

The occurrence of the joint Simon-Effect (JSE) can be regarded as an indirect measurement of self-other integration in dyadic interactions. Current JSE research hints towards a prominent role of the co-actor's agency and/or intentionality without fully differentiating between bottom-up and top-down manipulations. To separate bottom-up and top-down modulation effects, we conducted a series of three browser-based Joint Simon experiments (N ≈ 300). Firstly, we established a new digital scenario to reliably evoke a virtual JSE. A virtual human hand was presented on the right side controlled by the participant. By performing a go/nogo-task with (joint) or without (individual) a second computer-controlled hand on the left side of the display, we showed a reliable JSE based on reaction times, and we varied the appearance of the virtual co-actor's hand between subjects, showing a stronger JSE for a human compared to a robot co-actor (E1). Additionally, the perceived agency of the co-acting hand was manipulated solely using visual information (bottom-up) by comparing a moving and a non-moving co-actor in the second experiment.

We found no effect for the agency-manipulation, but a persistent bottom-up-effect of the co-actor's hand (human vs. robot) indicating a prominent role of bottom-up-information regarding a virtual co-actor's intentionality. In Experiment 3, we showed an increased JSE for an intentional described (top-down) virtual robot as compared to a non-intentional virtual robot. Conclusively, this series of experiments suggests a model in which bottom-up and top-down information need to be integrated to fully understand the role of intentionality in joint action.

## **Training chaining- or ordinal position sequence knowledge under dual-tasking – evidence for encoding of across-task compounds**

Robert Gaschler<sup>1</sup>, Christoph Naefgen<sup>1</sup>, Lasse Pelzer<sup>2</sup>, & Hilde Haider<sup>2</sup>

<sup>1</sup>*FernUniversität Hagen*, <sup>2</sup>*University of Cologne*

It has long been documented that dual-tasking can corrupt implicit sequence learning. Recent evidence supports the view that this is due to automatic encoding and retrieval of across-task compounds. The stimuli and responses of one of the tasks follow a predictable and repeating order. Yet, they are encoded and retrieved as compounds together with the stimuli and responses of the other task – even when they do not follow a predictable order. In order to better understand sequence learning under dual-tasking conditions, the form of representation of serial order that can be acquired needs to be distinguished. In the current study we have developed a paradigm in which participants are either exposed to regularities in the task material that could allow them to acquire chaining sequence knowledge (associations among elements – i.e., next trial will be “c”, because the current one is “b” which is associated with “c”) or ordinal position sequence knowledge (association between elements and counters – i.e., next trial will be “c”, because the next trial is the third, and third is associated with “c”). In the sequence learning task participants reacted to a predictable sequence of letters by pressing the corresponding key. In chaining training, participants typed sub-units of a fixed sequence (starting points randomly drawn). In ordinal position training, we used two letter lists to draw first, second and third stimuli. In the other task, participants pressed the left or right foot-pedal for high vs. low tones. Our results show that chaining sequence knowledge can be acquired under dual tasking conditions when stimuli and responses of the two tasks occur as fixed compounds. If stimuli and responses are randomly sequenced in the pedal task, neither form of representation of serial order can be acquired. The results suggest automatic acquisition of sequence knowledge consisting of across-task compounds.





## **Automatic Response Activation in Conflict Tasks: Transient or Permanent?**

Ruben Ellinghaus<sup>1</sup>, Ian Mackenzie<sup>2</sup>, & Victor Mittelstädt<sup>2</sup>

<sup>1</sup>*FernUniversität Hagen*, <sup>2</sup>*Eberhard-Karls University of Tübingen*

The Simon effect (prolonged RT when the task-irrelevant stimulus location is incongruent with the response side) has been reported to decrease at longer RTs, which is reflected in negative-going delta functions. This finding has been attributed to a gradual dissipation of the response automatically activated by the task-irrelevant location information. Importantly, Ellinghaus et al. (2018) have demonstrated the delta plot slopes to be independent of stimulus duration. This finding is consistent with a brief and pulse-like automatic process as proposed by the Diffusion Model for Conflict Tasks (DMC, Ulrich et al., 2015). In this study, we will investigate whether there are task-specific modulations of the time-course of distractor-based activation (as measured via delta plot slopes) as a function of stimulus duration (brief vs. response-terminated) across different conflict tasks. Experiment 1 will compare the classic Simon task with the accessory Simon task, while Experiment 2 will compare the classic Simon task with the Eriksen Flanker task. To better understand how stimulus duration potentially influences the different conflict effects, we may also fit the observed (individual) behavioral data to the DMC and we will then also analyze the best-fitting parameters as a function of the experimental conditions.

## **Improving the measurement of object processing speed in visual search**

Talke Michaelsen, Markus Janczyk, & Heinrich R. Liesefeld

*University of Bremen*

The processing speed of visually perceptible objects is important in many scientific fields. Therefore, providing adequate methods to measure object processing speed is of high relevance. The slopes of the functions relating reaction times (RTs) in a visual-search task to the size of the search set (search slopes) have been used for this purpose, but are, unfortunately, not a valid measure of object processing speed. For example, it seems clear by now that many influences beyond mere processing time per object influence such search slopes (see Liesefeld & Müller, 2020) and that the relationship between the number of objects and RTs might actually be non-linear (Lleras et al., 2020). The present work aims at developing an entirely new approach: Instead of analyzing search times as a function of set size, we attempt to analyze search times as a function of the position of the target within displays of constant set size that are searched in a specific order. If this relationship is linear, the search slopes measured with our approach should provide a valid measure of processing time per item all remaining, but time-consuming processes affect only the intercept of the function. Rather than just presenting the final validated design here, we report on the process that led to this design to highlight the potential pitfalls of our novel approach and outline validated strategies to avoid them.



## Posters II

### **Binding and retrieval for rule-based actions and guesses**

Anna Foerster<sup>1</sup>, Birte Moeller<sup>2</sup>, & Roland Pfister<sup>1</sup>

<sup>1</sup>Julius-Maximilians University of Würzburg, <sup>2</sup>Trier University

One of the central mechanisms of human action control is prompt binding between actions and the acted-upon stimuli. Even if action execution slips, the intended but not executed correct response is bound to the relevant stimulus. The repetition of the same stimulus then retrieves the previously bound response, facilitating its execution. The current study scrutinized the role of structurally similar, memorized stimulus-response rules for such transient binding and retrieval. We hypothesized that access to these rules before responding would boost binding between stimuli and responses relative to guessing situations where rules only become available through feedback after responding. Moreover, we assessed whether the content of the feedback matters for binding, correcting for wrong guesses. We used a prime-probe design to induce stimulus-response binding for instructed and guessed responses in the prime and to measure retrieval of these bindings in response times and errors in the probe. Binding of a stimulus to its response in the prime should lead to faster and more accurate execution of the same than another response upon repetition of the stimulus in the probe compared to stimulus changes between prime and probe. The comparison of this effect between instructed, correctly guessed and incorrectly guessed responses reveals whether episodic binding between responses and acted-upon stimuli benefits from existing stimulus-response rules and whether it also emerges when these rules are absent by leveraging informative feedback after response execution.

### **Competition Without Unbinding: Event File Interaction in Response-Response Binding**

Christoph F. Geißler, Silvia Selimi, Philip Schmalbrock, Christian Frings, & Birte Moeller

*Trier University*

A key question in action control research is how actions are derived from perceptive input and intention. In this regard, binding accounts propose that perceptual features, goals, and actions have to be bound together into an event file to form concrete action plans. A consequence of these transient bindings is that if an element of an existing event file is repeated during the planning of a subsequent action, the whole event file is retrieved and can influence the execution of the planned action. It is empirically well documented that the full repetition of event file contents leads to facilitation of subsequent actions, while partial repetition of event file contents leads to interference with subsequent actions. The code occupation hypothesis assumes that partial repetition interference occurs, because feature-bindings in the existing event file do not fit the current action plan and have to be actively disassembled before the required features can be used to form the new action plan. We employed a response-response binding paradigm with a prime-intervening-trial-probe design to investigate residual binding effects in a probe, after an additional intervening action pair that was either a full change or a partial repetition from the prime. While we found that intervening-trials in general reduced binding effects in the probe, the type of intervening-trial (full change vs. partial repetition) did not substantially influence probe binding effects. This finding contradicts the code occupation hypothesis which would have predicted that prime event files should have specifically been disassembled in partial repetition intervening-trials. This should have led to substantially smaller binding effects in probes that follow a partial repetition trial, than in probes following a full change intervening-trial. As an alternative to code occupation, we argue that partial repetition cost might arise as a consequence of higher selection affordances.



## The value of control

Moritz Reis, Roland Pfister, & Katharina A. Schwarz  
*Julius-Maximilians University of Würzburg*

Voluntary actions are accompanied by a sense of control over this action and its effects. Forming an appropriate sense of control (or sense of agency) has widespread consequences of individual and societal relevance, such as a sense of responsibility and regret for undesired action outcomes. Moreover, it is possible that perceived control serves as a powerful action motivator, although this critical function has been addressed scarcely so far.

Thus, in this novel, experimental paradigm, we directly examined the value of control for human agents by allowing participants to choose between financial gain and situational control. Do participants choose control even if they sacrifice financial gain for it? And if so, how much would they sacrifice?

## Dissociating sub-processes of aftereffects of completed intentions and costs to the ongoing task in prospective memory: A mouse-tracking approach

Marcel Kurtz<sup>1</sup>, Stefan Scherbaum<sup>1</sup>, Moritz Walser<sup>1</sup>, Philipp Kanske<sup>1,2</sup>, & Marcus Möschl<sup>1</sup>  
*<sup>1</sup>Dresden University of Technology, <sup>2</sup>Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig*

Prospective memory is an essential aspect of everyday life that enables us to pursue intentions and remember to perform intended actions in the future. While previous research has established that pursuing intentions can incur costs in ongoing tasks due to engagement of controlled strategic processes and completing intentions can incur aftereffects due to continued intention retrieval, the underlying processes of these effects are still a subject of debate. In order to shed light on these issues, we used mouse-movement tracking to investigate prospective memory retrieval at different stages. First, we assessed the involvement of reflexive-associative and discrepancy-plus-search processes in the retrieval of completed intentions. Second, we assessed whether ongoing-task costs during intention pursuit are associated with strategic monitoring processes or with a strategic delay of ongoing-task responses. Lastly, we probed the potential interaction of processes underlying ongoing-task costs and processes underlying aftereffects of completed intentions.

Replicating previous findings, we found evidence for aftereffects of completed intentions, ongoing-task costs during intention pursuit, and increased aftereffects when pursuing a novel intention after intention completion. Notably, our analyses of mouse-movement data suggest that aftereffects of completed intentions can best be explained by a reflexive initiation of the completed intention, which is followed by a subsequent movement correction that we interpret as time-consuming response-verification processes. Regarding ongoing-task costs, we found that actively pursuing an intention most likely leads to a strategic delay of ongoing-task responses. Lastly, we found evidence for an interaction of these processes: Pursuing a novel intention after intention completion exacerbated orienting responses to deviant stimuli, increased the readiness to reflexively initiate the completed intention and substantially prolonged response-verification processes following reflexive intention retrieval. Our findings provide novel insights into the processes underlying intention retrieval and show that mouse-movement tracking can be a valuable tool to assess process dynamics in prospective memory.



## **Predictability modulates S-R binding effects, but modulation depends on spatial information**

Philip Schmalbrock, Christoph F. Geißler, & Christian Frings

*Trier University*

When we respond to a stimulus, stimulus and response features are integrated into a short-lived memory trace, called an event file. If some or all features comprised in an event file repeat in a later episode the previous event file is retrieved and can induce costs and benefits for the current behavior. These costs and benefits are together referred to as S-R binding effects. These effects can not only emerge for relevant stimuli but also irrelevant distractor stimuli. Previously it was shown that if certain characteristics of an episode are predictable these effects are entirely absent. These findings follow a growing body of evidence in the visual search literature that also demonstrates effects of predictability. However, the visual search literature also shows that their predictability effects work independently of stimulus / feature identity but are proactively implemented based on spatial information. We here merge the findings of predictability in visual search and S-R binding effect literature. We show that the influence of predictability on S-R binding effects also solely relies on spatial information. This further demonstrates the tight link between these areas of research and implies that the role of attention for S-R binding effects has been previously underestimated.

## **Valence Transfer via Response-Response Associations**

Tarini Singh, Eva Walther, & Christian Frings

*Trier University*

Evaluative Conditioning (EC) is the change in preference or liking toward a stimulus as a result of pairing that stimulus with other positive or negative stimuli (De Houwer et al., 2011). Much of the research on EC focuses on valence transfer via stimulus-stimulus associations to explain EC effects (e.g. Levey & Martin, 1979 Bayens et al., 1992). However, research on action control has shown that responding to a stimulus also results in an automatic association of stimulus features with response features (Hommel et al., 2001). Blask et al. (2016, 2017) provided evidence that EC can even occur via Stimulus-Response associations. The present study further investigates the underlying mechanisms of EC by testing whether valence transfer can occur via Response-Response associations. To this end, participants first underwent a motor conditioning phase in which they responded to positive or negative stimuli. Subsequently, participants underwent a response-response association phase, by which the valence of Response 1 is transferred to Response 2. Finally, the transfer of valence from Response 1 to Response 2 was tested by instructing participants to respond to stimuli whose valence was either congruent or incongruent to the valence of Response 2. Stimuli whose valence are congruent with the learned valence of Response 2 should lead to shorter RTs and lower error rates compared to stimuli whose valence is incongruent. The implications are discussed within the context of EC and its underlying mechanisms.

## **Termination of Ongoing Actions**

Viola Mocke & Wilfried Kunde

*Julius-Maximilians University of Würzburg*

Actions are more easily initiated if they foreseeably produce (e.g., spatially) compatible as opposed to incompatible environmental effects. According to ideo-motor accounts, these action-effect compatibility effects occur because an action is planned before its execution by anticipating its perceptual effects. Possibly, effect anticipation happens not only before action initiation, but also before action termination. Specifically, an ongoing action might be terminated by replacing the currently being executed 'action plan' with a new 'termination plan' which consists of the anticipated perceptual effects of stopping the ongoing movement. This experiment tests this novel idea of 'termination by formation of a new plan' for continuous movements. Participants move their hand on a digitizer tablet either clockwise or counterclockwise in a certain



speed. At an unpredictable time point a visual halt signal is presented, which requires them to immediately terminate the circular movement. Doing so causes in different blocks, and thus predictably, a visual movement on screen that either does or does not share the direction feature (clockwise or counterclockwise rotation) with the just terminated hand movement. If the anticipated effect of terminating shares its direction feature with the ongoing movement, anticipating the effect direction might retrieve the movement from the currently being executed 'action plan'. In that case, terminating a movement might be more difficult if the directions of this movement and of the effect of terminating it are compatible than when they are incompatible. This would show in a reversed compatibility effect.



# Talks I

## Reward effects in overlapping dual-task situations

Leif Erik Langsdorf and Torsten Schubert  
*Martin-Luther University Halle-Wittenberg*

In dual-task (DT) situations, participants perform two tasks, the first and the second task (task1 task 2). Participants allocate resources to perform those tasks. We investigated how the magnitude of reward affects task 1 and task 2 performance.

Numerous studies demonstrated that reward enhances performance. If resource allocation is proportional to the magnitude of reward, rewarding task 1 and task 2 should result in a greater reduction of reaction time of task 1 (RT 1) and task 2 (RT 2) in rewarded compared to unrewarded contexts, compared to when only task 1 or task 2 is rewarded.

In Experiment 1, we provided reward for task 1 performance, resulting in reduced RT 1 and RT 2 in rewarded compared to unrewarded conditions. Indicating that participants allocated more resources to task 1 and task 2 in rewarded compared to unrewarded conditions.

In Experiment 2, reward was provided for task 1 and task 2 performance, thus doubling the reward compared to Experiment 1. Resulting in reduced RT 1 and RT 2 in the rewarded compared to the unrewarded condition, as well as compared to Experiment 1. Participants again allocated more resources to task 1 and task 2 performance in rewarding contexts. Importantly, the results indicated that the magnitude of reward affected participant's resource allocation to task 1 and task 2. Providing evidence for proportional magnitude effects of reward on participants' performance across Experiment 1 to Experiment 2.

In experiment 3, we test whether the doubled amount of reward for task 1 performance compared to Experiment 1, affects participants' performance similar as in Experiment 2 compared to Experiment 1. Which would indicate that the doubled amount of reward affects the resource allocation of the participants in a proportional manner.

## How long can control states persevere? Applying the fade out paradigm to dual tasking

Amelie Jung, Inga Mögling, & Rico Fischer  
*University of Greifswald*

One frequently investigated aspect of cognitive control concerns the generality and persistence of induced control adjustments. When performing dual tasks (DT), control states are established that help to manage between-task interference. These processing adjustments even persist when new stimuli or task sets are introduced (Surrey, Dreisbach & Fischer, 2017). In the present study, we wanted to investigate to which extent control states persist even if there are not of necessity anymore, e.g., if one of the task sets of a dual task becomes irrelevant. For this, we adapted the *fade-out paradigm* (Mayr & Liebscher, 2001) to a dual-task setting. In a first experiment, participants ( $N = 40$ ) underwent blocks of DT in order to establish dual-task specific control states. Later on, one of the tasks was eliminated. Results showed that performance in this fade-out block did not immediately drop to single-task performance (fade-out costs) representing persistence of control states. In a second experiment ( $N = 80$ ), the frequency of between-task interference in DT blocks was manipulated (75% vs. 25%) to establish conflict-biased control states. It was tested whether these different control states would bias subsequent fade-out costs accordingly. A third planned experiment will investigate whether instruction-based control states will show similar effects as the implicit manipulation of conflict frequency. The expected results of Experiments 2 and 3 will be discussed.





## **Training-related improvements of task-order coordination in dual-task situations: On training and transfer effects**

Daniel Darnstaedt, Sebastian Kübler, & Torsten Schubert  
*Martin-Luther University Halle-Wittenberg*

In dual-task (DT) situations task-order coordination (TOC) processes are required to schedule the processing of the two component tasks as is indicated by studies showing increased TOC costs in DT situations with variable compared to fixed order of the component tasks.

The current online study investigated whether TOC processes can be improved by training which would be indicated by reduced TOC costs after compared to before training. Additionally, we asked whether TOC processes operate as higher-order, i.e., stimulus-unspecific processes by testing for transfer effects of the improvements to new, untrained stimuli.

For that purpose, participants trained the same two visual-manual component tasks in three different groups: a single-task group (component tasks separately), a DT group with fixed order of component tasks and a DT group with random order. The latter group trained flexibly changing the processing order of the component tasks, while the other two groups did not train such TOC processes. N=53 participants practiced for three days at first. In pre- and post-training sessions. TOC costs were measured and compared between groups.

Results indicate that we improved TOC (i.e., reduced TOC costs) for the group with random order, exclusively. Due to the lack of group-specific transfer effects we extended the training duration for another four days. In a consecutive, second post session the TOC improvement could be transferred to new, untrained stimuli.

According to previous studies we assume a task-order representation, the task-order set, that contains only information about the processing sequence of both component tasks. In analogy to the efficient task instantiation (ETI) model, training of flexibly adapting the processing order of two temporally overlapping component tasks could lead to an efficient, conjoint instantiation of both potential task-order sets before trial onset and, thus, facilitate the processing of such DT situations on a stimulus-unspecific level.

## **Effects of 18 hours fasting on task choice and performance in voluntary task switching paradigm with food stimuli**

Viktorija Maydych, Sebastian Kübler, & Torsten Schubert  
*Martin-Luther University Halle-Wittenberg*

Previous research has demonstrated that affective stimuli gain enhanced access to attentional resources and that this causes switch cost differences when participants switch between affective and non-affective task-sets in cued task switching. The aim of the present study was to investigate, how 18h food deprivation (i.e. fasting) and habitual restrained eating influenced the freely determined task choice and performance in voluntary task switching paradigm with neutral digit and affective food stimuli. Fasted (n=28) and sated (n=29) participants categorized digits from 1 to 9 (except 5) as odd or even and food pictures as sweet or savory. Participants were instructed to freely decide which task to perform in each trial, but both tasks had to be performed equally often. Restrained eating was operationalized through German version of the Three-Factor-Eating-Questionnaire. Results showed lower switch cost when switching to the food task (134 ms) compared to switching to the neutral digit task, (246 ms,  $p < .001$ ) in both groups. Switch cost when switching to the neutral digit task was significantly higher in fasting group (283 ms) compared to the sated group (209 ms  $p < .05$ ). Restrained eating was not related to any of the switch costs. There was also no effect of fasting and restrained eating on task choice and on switch rate. Our results indicate that the emotional content of the stimulus situation of a task-set leads to faster activation of this task-set in working memory, which results in smaller switch cost. The observation of larger switch cost for the neutral task fits the assumption that due to higher activation of the affective task-set, more effort is needed to overcome the task-set of the food task in order to activate the task-set of the neutral digit task.





## Talks II

### **The role of task-relevant and task-irrelevant information in congruency sequence effects: Applying the Diffusion Model for Conflict Tasks**

Valentin Koob<sup>1</sup>, Ian Mackenzie<sup>2</sup>, Rolf Ulrich<sup>2</sup>, Hartmut Leuthold<sup>2</sup>, & Markus Janczyk<sup>1</sup>

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In conflict tasks, such as the Simon, Eriksen flanker, or Stroop task, the congruency effect is often reduced after an incongruent compared to a congruent trial: the congruency sequence effect (CSE). It was suggested that the CSE may reflect increased processing of task-relevant information and/or suppression of task-irrelevant information after experiencing an incongruent relative to congruent trial. In the present study, we contribute to this discussion by applying the Diffusion Model for Conflict tasks (DMC) in the context of CSEs. We argue that DMC independently models the task-relevant and task-irrelevant information and thus is a first good candidate for disentangling their unique contributions. We studied CSEs using DMC in two complementary ways. In a first approach, we fitted the original DMC and an extension of DMC conjointly or separately to previously congruent or incongruent trials, using several empirical flanker and two Simon data sets. In a second approach, we explicitly implemented a cognitive control mechanism to simulate the influence of increased processing of task-relevant information or suppression of task-irrelevant information. Both approaches seem to demonstrate that the suppression of task-irrelevant information is important to create the typical CSE pattern. Increased processing of task-relevant information, however, could not describe the CSE accurately.

### **A touching advantage: investigating the influence of stop-signal modality on reactive response inhibition in the Stop-Signal Task**

Maximilian A. Friehs<sup>1</sup>, Philip Schmalbrock<sup>2</sup>, Martin Dechant<sup>3</sup>, Simon Merz<sup>2</sup>, Gesa Hartwigsen<sup>1</sup>, Regan Mandryk<sup>3</sup>, & Christian Frings<sup>2</sup>

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Stopping an already initiated response is vital for adaptive everyday behavior. For example, every athlete knows the feeling that a just initiated action is wrong or leads to a disadvantage. A table tennis player might notice – while actually returning a serve – that the serve went out wide. In the laboratory, the ability to inhibit already initiated responses can be measured using tasks such as the Stop-Signal Task (SST), which typically requires reaction to a visual go-signal and the subsequent stopping of a reaction on a small subset of trials. What remains unclear is whether or not the modality of the stop-signal has any influence on the performance. We hypothesized that the tactile stop-signal condition would have a performance advantage in an otherwise visual task. In multiple experiments we evaluate the effects of a cross-modal stop-signal and the results show a significant performance advantage of tactile stop-signals as compared to visual ones in an otherwise purely visual task. However, the influence of modality on SST performance in complex environments remains even less clear and it could be assumed that distracting stimuli only affect stopping performance if they are presented in the same modality as the stop-and-go-signal. But if distractors are only presented in the modality of the go-signal it might have no effect at all or only affect the go-reactions. At the time of submission, two studies are in preparation that tackle this question. Our results have widespread implications as for example, a car manufacturer might be tempted to display all information on a visual heads-up-display, however since a driver mostly reacts to visual information an additional visual stimulus might not be best suited for initiation of the most efficient stopping process.



## Changing cognitive representations of food stimuli through the use of if-then plans in a Stop-Signal-Task

Ulrike Schwarz & Caterina Gawrilow  
Eberhard-Karls University of Tübingen

Many people experience overeating from time to time, such as eating a cake even though they are not hungry, or indulging in something even though they have already eaten. This deficit in inhibition, we sought to overcome by altering mental representations of food using a series of implementation intentions. Implementation intentions support people creating better inhibition and to overcome the intention-behaviour-gap via an if-then-format.

According to the two-process model of Strack and Deutsch (2004), there is a reflective and an impulsive mental system. The reflective processing of stimuli corresponds with an amodal representation - the impulsive processing with a modal representation. In our study the implementation intentions focused on either amodal (abstract e.g. „If the cake appears, then I’ll imagine putting it in a box.“) or modal (concrete e.g. „If the cake appears, then I’ll grab it and look at it very carefully.“) representations of food stimuli. We hypothesized that amodal implementation intentions would lead to greater abstraction and thus strengthen inhibitory control, whereas modal implementation intentions would impair inhibitory control.

To test the effectiveness of these implementation intentions, a stop-signal task was administered to 88 individuals with healthy eating habits. All participants were randomly divided into a modal and an amodal group. Inhibitions were measured before and after the use of implementation intentions.

Consistent with the hypotheses, the use of amodal implementation intentions strengthened inhibitory control. Contrary to expectation, we found no change in inhibitory control after using modal implementation intentions. Nevertheless, the results on amodal implementation intentions are very promising and highlight the potential benefits of implementation intentions in eating behavior. Especially people with binge eating disorder suffer from lack of inhibition when confronted with food stimuli. Future studies should therefore focus on replicating these results and testing implementation intentions in the context of eating disorders.

## Dissociating affective conflict and social intentions triggered by emotional facial expression of ingroup or outgroup members

Robert Huber<sup>1</sup>, Rico Fischer<sup>1</sup>, & Julia Kozlik<sup>2</sup>  
<sup>1</sup>University of Greifswald, <sup>2</sup>University medicine Greifswald

A frequent observation in intergroup research is that reactions to emotional displays differ as a function of group membership. A confrontation with a happy ingroup member, for example, results in concordant approach reactions, whereas happy outgroup members induce discordant avoidance reactions. There are two explanatory approaches for this phenomenon: (1) The *social intentions account* proposes that this response divergence is determined by underlying social messages within the face. (2) The *processing conflict account* assumes this response pattern to be caused by an affective conflict triggered by incongruent combinations of emotion and the affective connotation of group membership. Our goal was to distinguish between both approaches by separating social intentions from the affective conflict. For this, we created a new paradigm, in which the participant is an outside observer of a social interaction between two displayed persons (i.e., a target and a distracter person). Target and distracter could either share their group membership or not. Participants were required to categorize the emotion displayed by the target, which also could either be ingroup or outgroup in relation to the participant. Thus, with this setup, social intentions critically hinge on the target-distracter group relation, whereas affective conflicts result from the target-participant relation. In multiple experiments, the target-participant relation interacted with the emotion expressed by the target, suggesting that responses are affected by affective conflict. However, the target-distracter relation did not interact with emotion, which indicates no influence of social intentions on participants’ reactions. In sum, our data speak in favor of the conflict instead of the social intentions account.



## Talks III

**How landmarks influence tactile target localization**

Paula Soballa, Christian Frings, & Simon Merz  
*Trier University*

Visual landmarks have shown to influence the localization of visual targets in two ways. First, target localization near landmarks has shown less variability. Second, landmarks seem to attract the estimated target location in that targets are localized as closer to the landmark as they were originally presented. The influence of tactile landmarks on tactile target localization is much less investigated, yet no less interesting. Especially, because two different types of landmarks can be found in the tactile modality. On the one hand, tactile perception is influenced by anatomical landmarks such as joints or the navel. On the other hand, comparable to the visual modality, landmarks can also be presented artificially for example through touch or vibrotactile stimuli. In contrast to previous research, which has been focused on anatomical landmarks, we aimed to investigate whether artificial landmarks similarly influence tactile perception. In an experimental series (each  $N = 24$ ) we observed the influence of tactile landmarks by presenting vibrotactile stimuli as landmarks and targets on the volar side of the left forearm. With either centrally or peripherally presented landmarks, we showed that the estimation of four different target locations differed depending on whether a simultaneous landmark was presented. Similarities and dissimilarities to the perception of both anatomical tactile landmarks and visual landmarks as well as theoretical implications of the observed data patterns will be discussed.

**Investigating the vertical SMARC effect for loudness in a timbre discrimination task**

Sarah Koch & Sven Blankenberger  
*Martin-Luther University Halle-Wittenberg*

In loudness discrimination tasks with vertical arranged response keys, a SMARC effect (Spatial-Musical Association of Response Codes) for loudness occurs: Participants react faster to loud tones with a top-sided response key in comparison to reacting with a bottom-sided response key and vice versa for soft tones (Bruzzi et al., 2017).

This effect indicates a spatial representation of loudness and is typically explained by a generalized magnitude representation system with spatially organized magnitude dimensions (e.g., A Theory of Magnitude, Walsh, 2003). If the vertical SMARC effect for loudness is due to a spatial representation, the effect should also occur when loudness is not explicitly judged. However, empirical evidence for this assumption is still missing. Therefore, the current study investigated whether the vertical SMARC effect for loudness would still occur in a timbre discrimination task.

In each trial of the experiment, participants ( $N = 36$ ) heard a single tone and they had to decide whether it was a sawtooth wave tone or a rectangle wave tone by pressing a top-sided or bottom-sided response key. Additionally, the tone's loudness level varied from soft to loud with six different loudness levels for each timbre. To test our hypothesis, we ran a linear regression with loudness level as predictor and difference of reaction time (RT for top-sided responses minus RT for bottom-sided responses) as dependent variable. We found a negative regression coefficient indicating the presence of the SMARC effect. Differences between the SMARC effect in loudness discrimination tasks and in timbre discrimination tasks as well as the implications for an assumed spatial representation of loudness will be discussed.



## **Veracity and Memory: How metainformation about the veracity of information affects scene memory**

Nicole Antes<sup>1</sup>, Markus Huff<sup>2</sup>, & Stephan Schwan<sup>1</sup>

<sup>1</sup>*IWM Leibniz-Institut für Wissensmedien*, <sup>2</sup>*Eberhard-Karls University of Tübingen*

False information influences memory, beliefs, and judgments in a variety of settings (e.g., social media, courtrooms, newspapers) and across a variety of topics (e.g., climate change, vaccinations, crimes). The present work tests how providing metainformation about the veracity and the discriminability of true and false statements influence the mental representation of a scene. We assumed that, first, the mental representation becomes more inaccurate as indistinguishability increases. Second, we expected that an increased number of statements, time pressure, or division of attention affect the accuracy of mental representations. The present experiment realized three conditions (between-subjects). In two of them, the discriminability between true and false information was realized by means of easily or hardly distinguishable font colors. In the control condition, there was no visual indication of the truth content of the statements. Participants read one of five scene descriptions consisting of true and false information. We measured recognition memory and participants provided confidence ratings. An online experiment (pre-registered at [https://aspredicted.org/R9N\\_L4B](https://aspredicted.org/R9N_L4B)) with N = 179 participants was conducted to test the memory for each sentence of a scene description. First analyses showed that the presence of metainformation about the veracity decreased participants' overall memory performance compared to the control group. However, no interaction effect was found between the veracity and discriminability of the statements. Further analyses on the confidence estimation and linguistic markers will be conducted. We are planning additional analyses as a basis to prepare the next experiment. Understanding the variables that contribute to the mental representation of scenes is also important for other research such as the spreading of Fake News, testimony, or news reporting of live events.

## **Understanding Sharing Behavior on Social Media Platforms: The Influence of Knowledge and Confidence**

Nadia Said<sup>1</sup>, Irina Brich<sup>2</sup>, & Nicole Antes<sup>2</sup>

<sup>1</sup>*Eberhard-Karls University of Tübingen*, <sup>2</sup>*IWM Leibniz-Institut für Wissensmedien*

There is no doubt that the rise of social media has shaped our world in the last decade. In recent years, the initial enthusiasm turned into concerns about unchecked sharing of false information. This has prompted a large body of research about interventions to not only improve people's ability to spot falsehoods but also to limit sharing of false information. Aim of our research is to gain a deeper understanding of the cognitive underpinnings of sharing behavior on social media platforms like Twitter. To this end, we conducted an online experiment with N = 434 participants assessing their sharing intention of true and false posts about COVID-19. We implemented two interventions on our social media platform ChirPing – that is (i) priming participants to focus on information accuracy and (ii) manipulating the deliberation time – assessing whether knowledge about the presented information as well as confidence in this knowledge moderate intervention effects. Results showed that only in the condition with no priming and short deliberation time, sharing intention of false information was significantly higher. Furthermore, knowledge and confidence in knowledge affected sharing intentions of true and false information differently: more accurate knowledge was only associated with a lower sharing intention of false information, with no impact on sharing intention of true information. Conversely, higher confidence in knowledge was only associated with a higher sharing intention of true information, with no impact on sharing intention of false information. This not only suggests that both priming accuracy and increasing deliberation time could be effective interventions against sharing of false information but also stresses the importance of differentiating between sharing of true and false information in further research.



## Talks IV

**The influence of effort instruction on passes with and without head fakes in basketball**

Nils Tobias Böer  
*Paderborn University*

Typically, head fakes in basketball are generated to deteriorate performance on the side of the observer. However, little is known about the potential costs at the side of the producer of such fake actions. Previous experiments on the production costs of head fakes in basketball (Güldenpenning et al., under revision) could show, that the production of passes with head fakes led to higher error rates and reaction times in trials where participants had little to no time to prepare the movement (interstimulus interval (ISI): 0ms, 400ms or 800ms). When participants had time to prepare the head fake (ISI: 1200ms) no differences to passes without head fakes could be found.

In this study, we address the question whether the production costs of head fakes (ISIs: 0ms or 400ms) can be modified when using effort instructions (asking the participants to try harder). Such potential changes in performance are based on the assumption, that the capacity that is available in a basic task is not fully used for the ongoing process, but a part is used for monitoring processes (e.g., observing the environment). If needed, more capacity can be willingly devoted to the task (Kahneman, 1973). In a study by Steinborn et al. (2017), effort instructions presented in the context of a fore period paradigm in 20% of trials led to improved performance.

Accordingly, in our paradigm for producing passes with and without head fakes with the same frequency we will present an effort instruction (straining) in 20% of all trials at the start of the trial, counterbalanced between passes with and without head fakes. In the remaining 80% of trials, a standard instruction (standard) is presented. The data collection is in progress right now. We expect a general decrease in the reaction times for passes with and without head fakes.

**Same, but different? Comparison of Signal-Detection Theory and Decision Diffusion Model**

Luisa Bogenschütz  
*University of Hildesheim*

The Signal-Detection Theory (Green, D.M. & Luce, R.D., 1966) and Diffusion Decision Model (Ratcliff, 1978 Ratcliff & McKoon, 2008) are two mathematical frameworks describing perceptual decision-making processes with two choice alternatives. Both models include parameters which are interpreted as decision sensitivity, respectively response criterion. The decision sensitivity parameters describe the capability to form a decision, for example to differentiate between two stimuli categories. Response criteria indicate a response bias which is independent of the competence to form a decision. While the Signal-Detection Theory (SDT) utilizes normalized hit- and false-alarm rates to calculate its parameters, the Diffusion Decision Model (DDM) bases its calculations on response time distributions of erroneous and correct trials. Even though both models have extensive applications in overlapping research fields, an empirical comparison is missing to this day. This lack of comparison is very unfortunate since it prevents the integration of studies which utilized one of the given models. Additionally, since both models' parameters' interpretations are the same, an empirical comparison could either strengthen or question the parameters' common apprehensions.

In my talk I will present 3 studies conducted to fill this gap. A previously conducted study using a color discrimination paradigm revealed a high correlation between the two models' decisional sensitivity parameters but lacked in a correlation of the decision criteria. To further test this pattern, two studies using a recognition memory paradigm will be conducted and its data presented in the talk.





## **Response-response binding with auditory stimuli**

Silvia Selimi

*Trier University*

In everyday life, interacting with our environment encompasses responding to stimuli of different sensory modalities. Current action control theories propose that simple actions like responding to a stimulus lead to the binding of stimulus and response features into a common representation. Repetition of any of these features retrieves the other bound features, thus influencing further responding. Furthermore, this principle of binding and retrieval also applies to actions of higher complexity, as also features of multiple responses can be bound to each other and thus retrieve each other, so-called response-response bindings (Moeller & Frings, 2019). Previous research has shown that bindings can not only occur responding to visual stimuli but also between auditory stimuli and responses. So far, the research on response-response bindings used visual stimuli. With previous findings in mind, this study tested whether response-response binding also occurs when responding to auditory stimuli and compared results from the visual and auditory domains. Indeed, results show that binding between responses occurs when responding to auditory stimuli, underlining that also binding in more complex actions is not limited to the visual domain. Findings serve as a basis to further investigate complex actions separated from influences of vision.

## **Less than the sum of its parts: Repeating a component of an event file does not retrieve the whole previous event**

Lars-Michael Schöpper, Renée Köhler, Birte Moeller, & Christian Frings

*Trier University*

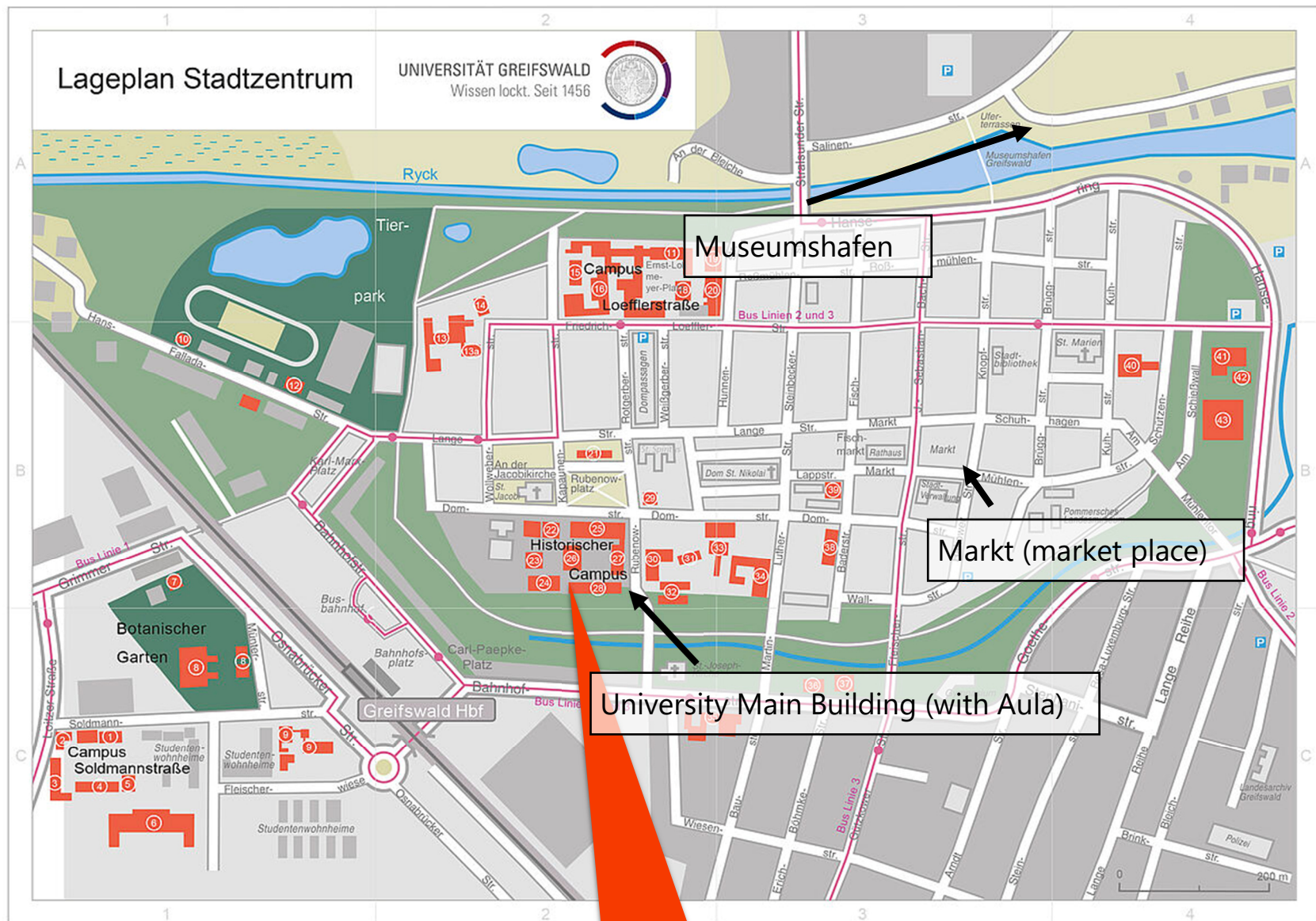
Binding approaches in action control assume that when responding to a stimulus, said stimulus' features and the accompanying response are integrated into an event file. If any component of the event file repeats, it is often assumed that the whole event file is retrieved and affects ongoing performance. In the current study we aimed to directly test this often-held assumption of action control theories. Participants discriminated the shape of stimuli in prime-probe sequences. From prime to probe, each shape was filled with vertical and horizontal stripes that could repeat or change. Additionally, from prime to probe the stimulus always changed its color. Crucially, shortly before probe onset the fixation cross became either the color of the prime (retrieval condition) or a third color (full change condition). We hypothesized that repeating the prime color would set on retrieval of the previous event file. There was a typical binding pattern between response and orientation of stripes. This effect was not further modulated by the fixation cross repeating or not-repeating the prime-color. However, the latter modulated response repetitions and changes, suggesting that the fixation cross indeed retrieved components of the prime event file. The results suggest that upon repetition of an event file, not all components are retrieved: Rather, binary/pair-wise bindings between individual components of the event file are retrieved and affect behavior.



Map







Festsaal & Aula

Hörsaal (HS 1)



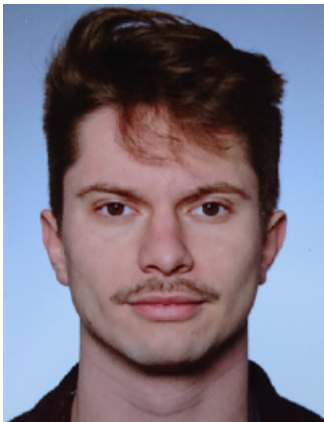
# Involved Persons



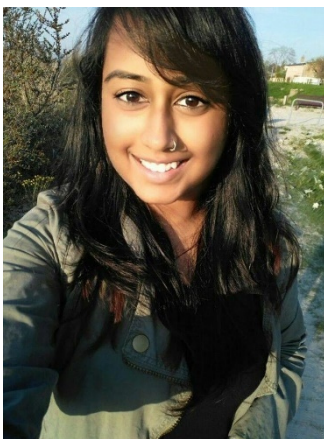
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