FORMULAIRE : CONTRATS DOCTORAUX
THÈMES DE RECHERCHE 2025

UNITÉ DE RECHERCHE

Intitulé :	Laboratoire de Psychologie du Développement et de l'Éducation de l'enfant – LaPsyDÉ	**Code UR :**	UMR CNRS 8240

DIRECTEUR / DIRECTRICE DE L'UMR OU DE L 'UR

Nom :	BORST	**Prénom :**	Grégoire
Titre :	PR		
Téléphone professionnel :	**01 76 53 30 32**	**E-mail :**	gregoire.borst@u-paris.fr

EQUIPE

Équipe :	NA	**Code UR :**	NA

DIRECTEUR / DIRECTRICE DE RECHERCHE POSTULANT

Nom :	Knops	**Prénom :**	André
Titre :	Directeur de Recherche CNRS, PhD		
Téléphone professionnel :	01 76 53 30 35	**E-mail :**	andre.knops@u-paris.fr
Co-direction envisagée :	Non		
Co-encadrement envisagé :	Non		

Doctorant(e)s encadré(e)s à la rentrée universitaire prochaine 2025 – 2026, y compris hors UPCité (Nom Prénom et année 1ère inscription ; si hors UPCité, précisez l'établissement) **:**	**-1-**	Alexis Garsmeur (année universitaire 2022-2023)
	-2-	Marie Jacquel (année universitaire 2022-2023)
	-3-	Roman Janssen (année universitaire 2023 - 2024)
	-4-	Laurine Milon (année universitaire 2024-2025)
	-5-	

THÈME DE RECHERCHE

TITRE DU THÈME DE RECHERCHE

(250 caractères maximum - espaces compris)

Exploring contextual and interpersonal factors influencing the spatial coding of acquired knowledge

DESCRIPTION DU THÈME DE RECHERCHE

(3000 caractères maximum - espaces compris, sans liste de bibliographie)

It has repeatedly been argued that space serves as a medium to organize semantic structures in our mind. In particular, it has been argued that the spatial organization pertains to various domains such as quantity (Eccher et al., 2025), time (Bonato et al., 2012) or learned order (Luyckx et al., 2019). However, several questions remain. First, it remains debated whether space only serves to organize short-term memory (STM) content or whether long-term memory (LTM) is also spatially structured (van Dijck & Fias, 2011). Second, different studies report opposing directionality of the spatial organization of newly acquired conceptual knowledge and the factors that shape this remain unclear. While Luyckx and colleagues (2019) report a left-to-right organization of item values that have been acquired via a Bandit game, akin to the organization of numerical quantity, von Hecker and colleagues (von Hecker & Klauer, 2021b, 2021a) demonstrated in a series of experiments that dominance (in contrast to magnitude) leads to an orientation of the internal list where the most dominant item is on the left. Pointing beyond contextual factors (e.g. dominance vs. value), preliminary results from my lab demonstrate that the spatial organization may be person-specific. That is, after having been trained on the same transitive series, about 60% exhibit a left-to-right organization of the series (akin to a number line), while the remaining 40% show the reverse pattern. Third, the mechanisms that allow participants to accommodate new information concerning previously learnt conceptual knowledge remain underspecified. In particular, the mechanisms that govern the combination of two previously independent series into a unified framework remain elusive.

The current project addresses these questions in two series of behavioral experiments in healthy adults.

In series 1, participants will be trained via reinforcement learning on a transitive series (A<B<C<D<E<F<G<H), where letters represent arbitrary symbols. In a test phase, we will use behavioral markers and paradigms to probe the spatial structure of the acquired series. These include attentional cueing paradigms, spatial congruencies, and space-rank associations (similar to the SNARC effect) along major spatial dimensions (horizontal, vertical). Person-related candidate factors will be collected to unravel potential predispositions (handedness, counting direction, internal coding, …). In series 2, participants will be trained on two independent series (e.g. A<B<C<D<E<F<G<H; K<L<M<N<O<P<Q<R). In a test phase, participants will be told how these series relate to each other (e.g. A<B<C<D< K<L<M<N<O<P<Q<R<E<F<G<H). We will probe space-rank associations and distance effects to explore the mechanisms that govern re-organisation.

References

Bonato, M., Zorzi, M., & Umiltà, C. (2012). When time is space: Evidence for a mental time line. *Neuroscience & Biobehavioral Reviews*, *36*(10), 2257–2273. https://doi.org/10.1016/j.neubiorev.2012.08.007

Luyckx, F., Nili, H., Spitzer, B., & Summerfield, C. (2019). Neural structure mapping in human probabilistic reward learning. *eLife*, *8*, e42816. https://doi.org/10.7554/eLife.42816

van Dijck, J.-P., Abrahamse, E. L., Majerus, S., & Fias, W. (2013). Spatial Attention Interacts With Serial-Order Retrieval From Verbal Working Memory. *Psychological Science*, *24*(9), 1854–1859. https://doi.org/10.1177/0956797613479610

von Hecker, U., & Klauer, K. C. (2021a). Are Rank Orders Mentally Represented by Spatial Arrays? *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.613186

von Hecker, U., & Klauer, K. C. (2021b). Spatial processes in category assignment. *Journal of Experimental Psychology: General*, *150*(3), 446–465. https://doi.org/10.1037/xge0000907