Building, emptying out, or dreaming? Action structures and space in undergraduates' metaphors of academic writing

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Abstract: The aim of the present study is to bring new momentum into research on students' understanding of academic writing. Drawing on the idea that metaphors give insight into implicit conceptions of abstract entities and processes, we developed a detailed and differentiated set of conceptual metaphors that can be used to study student ideas about writing in research, teaching, and interventions. A large sample of undergraduates produced their everyday understanding of writing in short texts beginning with a self-generated metaphor. Based on theories from cognitive linguistics, the conceptual metaphors in their texts were analyzed in terms of their action quality (transitivity) and spatiality (spatial primitives). The undergraduates' conceptualizations were very heterogeneous. Most metaphors depart strongly from scientific approaches to academic writing within cognitive psychology and sociocultural theory. Roughly half of the metaphors could be collated to one of four metaphor systems. Depending on the desired degree of abstraction or concreteness, conceptual metaphors or metaphor systems can be employed in further studies to illuminate thinking about writing.

Keywords: metaphor analysis; academic writing; transitivity; spatial primitives

journal of WRITING RESEARCH

Scharlau, I., Rohlfing, K., & Karsten, A. (2021). Building, emptying out, or dreaming? Action structures and space in undergraduates' metaphors of academic writing. *Journal of Writing Research, 12*(3), 493-529. https://doi.org/10.17239/jowr-2021.12.03.01

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1. Introduction

Writing skills are essential for higher education and most students have to develop them after entering higher education. There are many potential causes for difficulties with and in writing, ranging from poor institutional support and little training over little content knowledge, insufficient motivation or inadequate strategy use to negative attitudes towards writing. Whereas cognitive, motivational and self-regulatory processes have attracted interest early in research on writing (e.g., Emig, 1977; Flower & Hayes, 1980; Bereiter & Scardamalia, 1987; Zimmerman & Risemberg, 1997), conceptualizations of writing, that is, ways in which students think about or imagine writing, have only recently come into focus, in the wake of studies on learners' understanding of learning (McCune, 2004; Paulson & Armstrong, 2011; White & Bruning, 2005).

1.1 Conceptualizations of academic skills

Research into learners' conceptualizations of academic skills started in the domain of learning, as learning orientations when dealing with texts (e.g. Marton & Säljö, 1976) or as approaches to learning (Biggs, 2001; Entwistle & Peterson, 2004). These studies showed that students have notably different approaches towards the complex skills of learning and also indicated that such approaches may be systematically related to learning outcomes.

A closer parallel to the present study is provided by research on beliefs about reading. Schraw and Bruning (1996, 1999) distinguished between two belief systems: reading as information transmission or as transactional. In the transmissional view, reading means taking up preformed knowledge that is transmitted by the author or text to the reader, mainly in the form it already has. According to the transactional view, both author and reader bring their knowledge and assumptions into this process and, as all information requires interpretation, new knowledge is created by reading.

Two parallel implicit beliefs have been identified for writing (McCune, 2004; White & Bruning, 2005). In the transmissional view, writing aims at communicating pre-defined content from authoritative sources to readers. An example from the questionnaire is "Writing's main purpose is to give other people information" (White & Bruning, p. 172). The transactional view focuses on the construction of meaning by writers and thus puts more emphasis on the writers, who are assumed to develop their understanding in relation to the text and the reader; writing here is often also an emotional experience. Example items from the questionnaire are "I keep going back to my writing to try to improve it" or "I am trying to develop a distinctive style as a writer" (White & Bruning, p. 172). Transmissional beliefs focus predominantly on content, transactional beliefs on processes (Baaijen, Galbraith & de Glopper, 2014). These two beliefs are independent of each other which means

that one can hold one of them, but also neither or both at the same time. Although students are aware of at least some of the individual beliefs, the system of their assumptions is usually nonconscious. That is, although a person may have the explicit assumption that writers communicate information to their readers as it is, or believe that meanings of texts are basically unambiguous, this does not mean that they hold an explicit transmission view: "Rather, we believe that most lack explicit awareness of the model that is implied by their system of beliefs, and that the model, rather than the beliefs per se, is implicit" (Schraw & Bruning, 1996, p. 294).

Belief systems can shape the goals and the strategies of readers and writers (for a review, see Vermunt & Vermetten, 2004) as well as predict part of the variability in students' performance. White and Bruning (2005), for instance, showed that low transmissional and high transactional beliefs were positively associated with overall text quality; the effects were of medium size and thus can be considered as practically relevant. Effects of writing beliefs were visible in specific criteria such as a positive association of transactional beliefs with voice and idea/content development and a negative association of transmissional beliefs with organization (for further evidence, see Baaijen et al., 2014; Limpo & Alves, 2014; Sanders-Reio, Alexander, Reio & Newman, 2014).

Most of the studies presented above assessed students' conceptions via questionnaires, that is, their approval of or agreement with different statements. While this method has many advantages (such as being economical and providing high objectivity), there are also shortcomings: Most importantly, conceptions or beliefs that the researchers do not know of cannot be assessed. Secondly, conceptions are assessed on the level of explicit statements. Less explicit assumptions may not be accessible with this method. Also, the logic of many questionnaires may easily be made out and students might adapt their rating behavior to avoid, for instance, inconsistencies. And finally, questionnaires often are rather poor in a semantical sense and thus difficult to relate to actual writing experiences and especially their variability. Although many authors agree that conceptualizations of academic writing are an interesting object of study and may exert relevant influences on writing, questionnaires thus are not optimally suited to go into the semantic details of conceptualizations. Therefore, a different approach is needed.

1.2 Metaphor analysis as an approach to conceptualizations

In the present study, we took an approach that focuses on the subtle and often implicit conceptualizations that undergraduates have of writing. A suitable methodological approach for this purpose is metaphor analysis in the cognitive linguistic tradition (Gibbs & Steen, 1997; Kövecses, 2002, 2005; Lakoff & Johnson, 2003). It rests on the idea that linguistic expressions allow conclusions about

cognitive concepts (Lakoff & Johnson, 2003). We analyzed undergraduates' metaphors of writing in order to understand their implicit conceptualizations of writing and the qualities they attribute to this activity.

Metaphors, in the cognitive linguistic view, are conceived of as everyday cognitive tools that allow people to understand something new or abstract (the so-called target domain) in terms of something known (source domain). The cognitive linguistic tradition understands all kinds of mapping of a complex target domain to a simpler or more concrete source domain as metaphors. This practice differs from, e.g., classical rhetoric metaphor analysis, where comparisons like "writing *is like* communicating" would not be understood as metaphors. Equally, the expression "writing *is* communicating" could be interpreted as a mere definition or description in an everyday reading, but if the concept used to define or describe writing is conceptually simpler or more concrete, the cognitive linguistics tradition reads this as a metaphor: Whenever somebody explains an abstract concept with a concept related to concrete experience, this is a cognitive metaphor. The expression of "being in the depths of despair," for instance, draws on the common spatial metaphor DOWN IS BAD, and if learning is described as "absorbing knowledge," this involves the common metaphors THE PERSON IS A CONTAINER and KNOWLEDGE IS A THING (in accordance with metaphor studies, conceptual metaphors are printed in small caps). Cognitive metaphors are content-rich because their source domain is an often tangible phenomenon. They are also rich in that they do not only highlight aspects (such as that learning means being in a receptive state in the case of "absorbing knowledge") but also hide others (such as that knowledge is not stable, as a thing would be).

Metaphor analysis has been applied to complex skills in the past (learning, teaching: Saban, Kocbeker & Saban, 2007; Sfard, 1998; Theado, 2013; Wegner, Burkhart, Weinhuber & Nückles, 2020; Wegner & Nückles, 2013, 2015a, b, 2016; reading: Paulson & Armstrong, 2011; Paulson & Theado, 2015; writing: Paulson & Armstrong, 2011; Levin & Wagner, 2006; literacies: Armstrong, 2008; for an overview, see Turner & Wan, 2018). Most of them analyzed metaphors by assigning them to categories obtained by inductive qualitative content analysis. This type of analysis creates salient categories which differ by content such as WRITING IS GAMING or WRITING IS FREEDOM OF EXPRESSION (Paulson & Armstrong, 2011), TEXT AS TOOL and TEXT AS AGENT (Paulson & Theado, 2015) or WRITING AS A CLOSED SPACE and WRITING AS AN OPEN SPACE (Levin & Wagner, 2006).

Similar to beliefs and belief systems, everyday metaphors are related to behavior. Based on a longitudinal study, Wegner and Nückles (2015) concluded that students' metaphors of learning change during their first year at university. The direction of change matched what Wegner and Nückles deem typical for the learning culture of universities: Metaphors after the first year more strongly indicated an understanding of knowledge as structured (instead of having no or a

simple structure) and learning as creating new knowledge (instead of acquiring or re-discovering something given). Ryan (2001) showed that the preferences students voiced for different conceptual metaphors of lecture learning (sponge, tape recorder, stenographer, code breaker, reporter, explorer) correlated with their preferences for certain note-taking practices in class. Landau, Oyserman, Keefer, and Smith (2014) experimentally demonstrated that framing college education as a journey towards a future identity had different positive effects on students' motivation and behavior compared to the metaphor of college education as a container. These effects included stronger intentions to study and, importantly, better exam performance up to a week after metaphor priming. Effects were of medium size. Finally, Wegner and Nückles (2016) reported that students' metaphors of learning predicted their intrinsic motivation, learning strategies and epistemo–logical beliefs as assessed in questionnaires. For example, students whose metaphors focused on problem-solving (e.g., LEARNING IS LIKE SORTING OUT THINGS) or personality development (e.g., LEARNING IS LIKE A GROWING PLANT) showed higher intrinsic motivation than those with knowledge-acquisition meta–phors (e.g., LEARNING IS LIKE BUILDING A LIBRARY; see also Wegner et al., 2020). Note that with the exception of Landau et al. (2014), these studies were correlational and thus did not prove a causal influence. Nevertheless, taking all of them into account, it is likely that a causal relationship between metaphors and studying behavior or outcomes exists and will eventually have to be explained by an influence in one or the other direction, or mutual influences.

As one step towards understanding this potential, we study the internal complexity of undergraduates' writing metaphors. Writing is a complex and complicated bundle of activities that puts high demands on the writer, and we address this complexity, which has not been in the focus of metaphor studies, especially.

1.3 What is writing, really? Scientific perspectives on writing and their metaphors

The complexity of writing has been addressed by different scientific approaches. At present, two perspectives are well spelled out, one from cognitive psychology, the other one from a sociocultural perspective. In the following paragraphs, we will explain these two approaches in order to extract central features which can then be compared to undergraduates' metaphors[1].

Sociocultural views: Dialogue and social practice. Sociocultural approaches to writing encompass the whole range of writers' literate activities (including writing, reading, speaking, and participating in other activities that involve texts and semiotic artifacts), and their embeddedness in social contexts of various kinds. The sociality of writing is acknowledged in two directions: Writing is seen to be both

shaped by social rules and conventions and to participate in shaping people's identities and their worlds.

One central concern of writing research in the sociocultural tradition is the complex entanglement of writing with other spoken or written texts. Written products are thus often conceptualized as artifacts or tools that mediate interaction across persons and time (Russell, 1997). Also, sociocultural theories highlight that every writing act is directed towards possible future responses, involving those of imagined and anticipated audiences. The collaborative and distributed nature of writing (Prior, 2006), its intertextuality (Bazerman, 2004) and its "lamination" with other contexts and situations (Prior, 1998; Prior & Shipka, 2003) are stressed.

This first concern leads directly into sociocultural approaches' preoccupancy with the dynamics of genre (e.g. Bazerman, Bonini & Figueiredo, 2009). Genres are types of utterances that emerge out of a community's entangled net of utterances (Bakhtin, 1986; Bazerman, 2002; Swales, 1990). Writers can express their ideas only in relation to a genre that enables and restricts every act of writing and guides the writing self's development (Bazerman, 2002). However, writers are not fully subjected to the conventions of a genre. They can break with rules and expectations, though their audience will always answer to the specific grade of reference or non-reference to a prevalent genre, cheering on an unconventional way re-framing well-known facts, sanctioning naïve newcomers for their pretentious expressions or acknowledging the expertise of a writer who seems to know her stuff.

Such social dynamics are also looked at in approaches that deal with the enculturation of writers and their development of identity or self within communities of practice. Work in this area mostly refers to the concept of situated learning (Lave & Wenger, 1991). Sociocultural theories are both interested in what cultural resources newcomers to a community of writers need to acquire and in how they are acquired, i.e. in the *practices* of enculturation. Enculturation to a writing community – like a profession, the academic community at large or a specific discipline – transforms both the newcoming person and the community (Lea & Street, 2006; Lillis, 2003; Lillis & Scott, 2007).

A fourth area of interest in sociocultural approaches to writing is the socio-psychological writing process of the individual writer. This overlaps with the cognitive-psychological writing research to be presented below. However, the conceptualizations of the psychological processes are different for theoretical reasons. Socio-cognitively oriented approaches attend to the contextually situated character of writing and stress the influence of contextual prerequisites on the writer (Flower, 1994). Dialogically oriented approaches highlight the social character of the activities involved in writing, relying on the concept of internalization by Lev Vygotsky (Vygotsky, 1986, for a critical re-conceptualization see Bertau & Karsten, 2018). In this line of work the intrapersonal dialogue guides

the writer's activity and its plurivocality is put into focus (e.g., Prior, 2001; Karsten, 2014).

All sociocultural approaches share an interest in writing as an interactional activity that extends beyond the individual and the current situation. They conceptualize writing as a historically, culturally and contextually sensitive activity that is both specific for a given situation and person or group and responsive to related situations and people. However, there is one conceptual point where sociocultural approaches differ in their understanding of writing present in two contrasting scholarly metaphors of language: language as a repertoire of linguistic forms put to work in interpersonal activity vs. language as an activity itself. Taking the first metaphor, some sociocultural approaches understand linguistic forms and texts as semiotic artifacts and cultural tools that are used in the activity of writing. Writing is thus conceptualized as a complex process of handling (pre)fabricated things. One example is Matsuda's (2001) famous definition of voice in writing as "the amalgamative effect of the *use of discursive and non-discursive features* that language users *choose*, deliberately or otherwise, from socially available yet ever-changing *repertoires*" (Matsuda, 2001, p. 40, our italics). A second view sees language primarily as an activity that takes on certain forms or formations, and writing as one mode of language activity (see e.g. Karsten & Bertau, 2019). This concept highlights language not as a thing, but rather as a dynamic event extending in space and time and, most importantly, between people. As Prior (2001, p. 59) puts it in his argument for a dialogical notion of voice in writing: "language is neither inside nor outside, but *between* people (in the sense of flowing through and around them)".

The distinction between these two views is rather implicit, with only a few authors actively situating themselves in one perspective or the other. This is mostly so because few authors in the sociocultural tradition of writing studies discuss the relationship between language and writing. For our purpose, however, it is crucial to make the contrast visible, for the two views may resonate differently with metaphors of writing. The first sociocultural conceptualization of writing as putting linguistic structures to work implies high agency. It is associated with metaphors that conceptualize the actor as a working person and thoughts, words and texts as concrete objects that can be exchanged with other actors. The second sociocultural conceptualization of writing as one mode of language activity understands writing in terms of timely and spatially extended processes and as comparable to conversation, dance, music or other forms of structured interaction between people – resulting in a more interactive, but less agentive conception of the writer.

If students' everyday metaphors of writing were compatible with the sociocultural approaches to writing, we would expect metaphors that:

- are temporally and spatially extended and imply an activity that reaches beyond the acting person's radius of action and stretches over time,
- imply either high affectedness (writer as object of a transitive action) or high agency (writer as agent in a transitive action) in terms of embeddedness in social contexts, subjectedness to social norms and conventions and writers as social agents that influence, construct and shape social reality,
- emphasize interpersonally shared processes such as giving and receiving, talking to other persons, sharing situations, enabling contact,
- include the exchange of things, such as ideas-as-things, texts-as-artifacts,
- name other people as co-present, e.g. as receivers of actions,
- highlight restriction and guidance of actions by a force located outside the acting person (e.g. genre norms and conventions),
- include a notion of more or less expertise in performing actions and a imply the possibility of gaining expertise, learning (possibly in metaphors that contain the acquisition of things), development and change (possibly in metaphors that contain metamorphosis and change of form) and
- conceptualize cognitive processes as speaking and dialogue.

Cognitive views: Training a complex and recursive process. Research within psychology, nowadays most often identified with the cognitive psychology view, has drawn attention to the fact that the purportedly simple and linear process of writing consists of multiple parts or layers, for instance cognitive, motivational and metacognitive processes. Most cognitive psychologists see writing as problem solving (for an explicit exception, see Galbraith, 1992) and focus on the different actions in this process as well as the prerequisites of these actions such as skills/knowledge, beliefs/attitudes or motivation, and their control.

In one of the earliest approaches, Flower and Hayes (1980) identified as main components the writing process itself, the long-term memory (containing knowledge) and the writer's task environment. They dissected the process of writing into three main components, namely planning, translating ideas into written text, and reviewing, in a recursive cycle (for an early alternative, see Bereiter & Scardamalia, 1987; and for an interesting critique of the idea of planning, see Galbraith & Baaijen, 2018). This initial model has later been refined, for instance by Hayes (1996) who identified four main structural elements: the writers' motivation and affect, their knowledge, their cognitive processes (text interpretation, reflection and text production) and, as a central bottleneck, working memory (for

the most recent version see Hayes, 2012). Further approaches to dissect the elements of the cyclical writing process include models of self-regulation (e.g. Schunk & Zimmerman, 1997).

Spelling out one central component of these writing models, Kellogg (2001) distinguished between five processes that take place in working memory: planning, translating, programming, executing, reading, and editing. He stressed the central importance of cognitive overload (see also Kellogg, 2008; Olive, 2012) which denotes the situation that working memory capacity is exhausted while working on a text. Because the different processes involved in writing compete for the very limited capacity of working memory, overload is rather common in writing. It can partly be countered by externalization strategies, such as taking notes or talking, and by training. Indeed, all components of writing have to be trained so that writing can be seen as a process of lifelong expertization (Kellogg & Whiteford, 2009).

Coming back to the beliefs discussed in the Introduction, some researchers have identified what, as a goal of teaching writing, a mature understanding of writing should include. Although such an approach may sound too normative, it summarizes what is known from research as conditions favorable for writing. According to Bruning and Horn (2000), such an understanding consists of the following aspects: One sees writing as entering a conversation that fosters self-understanding and interaction. One has a positive attitude towards writing and engages in writing. While engaging in writing, one feels in control and not (or minimally) anxious. As many other psychologists, Bruning and Horn recognize that this is not a final stage or level of development, but a delicate equilibrium: Mature writers „somehow have struck balances between impatience and procrastination, between dull habit and anxious waiting for inspiration" (p. 25).

Summing up, if students' everyday metaphors of writing were compatible with cognitive psychology research we would expect metaphors that:

- focus on problem-solving,
- stress individual agency, most notably in planning, doing, and reviewing
- emphasize internal complexity of the activity of writing, that is bring forward a variety of sub-processes that, together, form a goal-directed overall process,
- emphasize temporal extension and recursivity,
- exemplify demands on the writer's activity and self-regulation, that is mention individual agency and responsibility and
- illustrate different constraints that have to be met for successful writing.

1.4 Exploring undergraduates' implicit conceptions with the help of metaphors

In their seminal study on metaphors, Lakoff and Johnson (1980) drew a distinction between singular *metaphorical expressions* in everyday language and the *metaphorical concepts or conceptual metaphors* these expressions feed into. In everyday language use, many utterances are of metaphorical nature, for instance in the common way of talking about learning as storing and retrieving information or the common expression of limited storage capacity. Taken together, these and related metaphorical expressions constitute a conceptual metaphor, for instance LEARNING IS STORING. Together with other conceptual metaphors that can be found in a community of speakers, such as LEARNING IS EATING, they form a complex understanding of a given target-domain that integrates several conceptual metaphors into a *metaphorical system*, LEARNING IS ACQUISITION (e.g., Sfard, 1998). Such metaphorical systems organize culture-specific views of complex and abstract concepts and provide a conventionalized horizon into which individual experience with the respective target-domain is integrated.

To guide our metaphor analysis and to account for the high complexity of the possible source domains applied in conceptualizing writing, we specified Lakoff and Johnson's (1980) general notion of concept structure in two ways, aspects of action quality and spatiality.

To give an example for action qualities, compare the following quotes by writers Jane Austen and Virginia Woolf. Virginia Woolf writes that "fiction, imaginative work that is, is not dropped like a pebble upon the ground, as science may be; fiction is like a spider's web, attached ever so lightly perhaps, but still attached to life at all four corners. Often the attachment is scarcely perceptible" (Woolf, 1928/2000, p. 43), whereas Jane Austen's described her writing as "The little bit (two inches wide) of ivory on which I work with so fine a brush, as produces little effect after much labour" (Austen, 1816/2011, p. 337). Describing writing as DRAWING emphasizes individual action whereas the SPIDER'S WEB or its ATTACHMENT hides or deemphasizes activity and implies little, if any, affectedness of the object of the action. (Although Woolf focuses on genre differences, not on the action of writing, those genres would have to be produced by a person.) A structural mapping of writing with drawing would indicate both a discernable object (e.g. paper or, as in Jane Austen's example, ivory) and some affectedness of this object. Furthermore, both metaphors imply a rather small area where the activity takes place, combined with a to-and-fro-movement between the actor and the object (the actor's hands and the object) in the drawing metaphor, but nothing of this kind in the ATTACHMENT metaphor. Both metaphors may include further objects with different functions for the activity, such as tools in the DRAWING metaphor or the (unspecified) things to which the web is attached. Note also that the DROPPING

metaphor Virginia Woolf chooses for scientific writing implies structures very different from ATTACHMENT, most notably a short and rather harsh LETTING GO.

Aspects of action quality such as the presence or absence of an actor, the presence of things, their affectedness by the action and its effectiveness work together in creating an overall impression of a complex activity. In grammar and discourse theory, the effectiveness with which an action takes place as it is semantically construed and linguistically expressed is denoted as *transitivity* (Hopper and Thompson, 1980). Hopper and Thompson differentiate between several *transitivity components*, which indicate the transitivity of an action expressed in a clause. For each component, an activity can be rated on a scale of high or low attribute value:

- number of participants (two or more – one; differing from Hopper and Thompson we counted human participants only)
- kinesis (action – non-action, e.g. a state)
- aspect (telic – atelic; that is, actions with or without endpoint)
- punctuality (punctual – temporally extended)
- volitionality (purposeful – nonvolitional)
- affirmation (an action happens or does not happen, e.g. is negated)
- mode (realis – irrealis, e.g. verbs in subjunctive mode)
- agency of the actor, that is the degree to which actors can affect things or events (high in potency – low in potency)
- affectedness of the object of the action (the object is highly affected – not affected by the event or action)
- individuation of the object of the action (highly individuated such as a certain thing – not individuated such as "something")

These components will be illustrated in more detail in the Methods section (Analysis, fourth step). For now, it is important to stress that the degree of transitivity in the conceptualizations of writing varies with the metaphors that the students chose. We are interested in the transitivity structures of the metaphorical expressions since they influence the metaphorically informed semantics of writing that students have and may play a role in guiding their writing activities.

In the analysis, we also paid attention to spatial structure. Space is, as Lakoff and Johnson (1980) already observed, a prominent aspect of metaphors, and one study of writing metaphors reported two conceptualizations in these metaphors that are spatially defined, open and closed space (Levin & Wagner, 2006). Lakoff and Johnson identified orientational metaphors as one of the three main categories of

conceptual metaphors and assume that they gain much of their meaning from human bodily experience. UP-DOWN, IN-OUT, FRONT-BACK, ON-OFF, DEEP-SHALLOW, and CENTRAL-PERIPHERAL are crucial spatial or orientational aspects of metaphors. Mandler (2012) proposed a list of meanings basic to human bodily experience motivated by developmental research and defined *semantic primitives* in terms of the roles of the objects involved: what they do and what is done to them. Prominent examples are INTO, which stands for something "moving into an opening of an otherwise closed shape" (Mandler, 2012, p. 427), THING that refers to "any perceptually bounded cohesive object" (ibid., p. 429), CONTAINER (a very prominent metaphor in many languages, Lakoff & Johnson, 1980), PATH and LOCATION. We explored to what extent spatial aspects accord with transitivity or provide additional information within conceptual metaphors and across metaphorical systems. Taken together, the degree of transitivity and the spatial structure of a metaphor reveal, as we argue, internal complexity and important qualitative features of the target concept under scrutiny.

Based on these theoretical considerations, we want to (1) develop and present a theoretically grounded system of conceptual metaphors of writing that captures their variety and can be used in further studies of students' conceptualizations of writing. We will present it in a manner that might be used as an (exemplary) coding handbook in further studies, making underlying recurrent action and spatial qualities visible. We (2) compare the conceptual metaphors to prominent theories of academic writing in order to understand how undergraduates' conceptual–izations might differ from or accord with scientific approaches.

2. Material and Methods

2.1 Participants

The present study is based on a sample of 143 texts, 75 from undergraduates enrolled in teacher training who participated in a seminar on motivation in two terms (2017, 2017/18) and 68 from undergraduates enrolled in a double major bachelor program in a seminar on the topic of voices (2016 and 2017). Most of the students were in their second or third undergraduate semester at a German university.[2] The metaphors were collected in the first session of a seminar on motivation. As there is no structured writing curriculum at the majority of German universities, the students had no systematic exposure to academic writing.

2.2 Procedure and material

In the first session of the seminar, the students received a sheet with the following instruction: "(1) Please complete this sentence with the image, analogy, or metaphor which comes to mind first. Writing is like … If you come up with several images, analogies, or metaphors, name all of them. (2) Describe or explain your

image or metaphor in a few sentences. For instance, you can describe similarities between writing and your image or motivate why you have chosen it."[3] Informed written consent was achieved from all students when they handed in their metaphors, which was voluntary.

The instruction asked explicitly for a source metaphor and an explanation or description (elicited metaphor, see Wan & Low, 2015). Students wrote down their metaphors individually and without time constraints, first the reading and then the writing metaphor. Texts were typed before analysis so that they were completely anonymous.

Note that we did not explicitly ask for a metaphor of *academic* writing. A preliminary study showed that explicitly mentioning "academic" pushed undergraduates into giving abstract definitions instead of metaphorical descriptions. Furthermore, we presumed that the setting of the inquiry within a seminar at a university would put enough emphasis on the academic context.

2.3 Analysis

The goal of our analysis was to develop a theoretically grounded system of conceptual metaphors for writing. Its focus was on this definition of conceptual metaphors by source domain, components of transitivity and spatial primitives. The metaphors were analyzed by a team of two coders inductively in a simplified version of qualitative metaphor analysis (e.g., Schmitt, 2017).

We will explain the procedure with the help of two example texts. Example 1: "Writing is … to express one's inner and personal feelings and views. – Writing enables us to express and explain our inner feelings – it gives us the opportunity to convey important things to other people." Example 2: "Writing is … a fountain full of fantasy. For me, writing is like a fountain full of fantasy, because when I write the ideas and fantasies literally bubble out of me."

First step: Identification of metaphorical expressions. Initially, metaphorical expressions related to writing were identified in the texts. In the first example, these are "express," "inner," "convey," and "things". In the second, these are "fountain," "full of," "bubble," and "out of." (There are a few more instances of metaphor in the texts, for instance the "given" opportunity. Only metaphorical expressions that directly related to writing were marked in the first step.)

Second step: Identification of metaphorical concepts. Then, possible metaphorical concepts were defined. In many cases, the metaphorical expressions could be directly related to such concepts, as in the first example (WRITING IS EXPRESSING and WRITING IS CONVEYING). In the second example, we decided upon the conceptual metaphor of WRITING IS FLOWING that has less linguistic overlap with the metaphorical expressions. Expressions in other texts that were collated to this

metaphorical concept are that "feelings, motivations, goals and ideas […] flow into the text" or "thoughts flow onto paper." We chose WRITING IS FLOWING instead of WRITING IS BUBBLING because the expression "bubbling" was rare and because bubbling and flowing share their transitivity characteristics (see step 4). Decisions necessary for resolving ambiguities when defining conceptual metaphors were discussed among the researchers until a consensual interpretation was reached.

Third step: Coding of the metaphors. Texts were assigned to one or more conceptual metaphors. We chose text as a unit of analysis because most of our texts were rather short and often the same conceptual metaphor appeared in different expressions within a text (for a similar decision, see Wegner & Nückles, 2015a).

Fourth step: Description of the conceptual metaphors including joining of strongly overlapping metaphors. Starting from possible conceptual metaphors found in step 2, we used three main approaches to describe them. *Lexical* or *qualitative metaphor analysis* focuses on describing the conceptual content of the source domain (Schmitt, 2017). In the examples above, this would be conveying something from an inside to an outside in WRITING IS EXPRESSING. Two distinctive features of the WRITING IS FLOWING metaphor are the non-human motion it implies and the presence of a liquid substance.

With *transitivity analysis* following Hopper and Thompson (1980), we described the transitivity components for each conceptual metaphor. More specifically, we used eight of the ten components of transitivity mentioned in the introduction. (Mode and aspect could not be used because they were fixed as realis/indicative and non-negation by our task: The prompt "Writing is like …" rendered responses with negation and in the subjunctive mode very unlikely.)

To illustrate transitivity analysis (components are italicized): Generally, the transitivity of EXPRESSING SOMETHING is rather strong. The actor is assigned a high degree of *agency* with a highly visible, bodily *action*. Note, again, that this general agency might not be realized on the utterance level. The example above is instructive in this sense because the actor appears only as the vague "one," not "I" or "writer", etc. There is no strong *affectedness* of the object of the action – on the contrary: expressing should stay true to its object. Although the object is mentioned, it is abstract instead of *individuated* ("things"). The example mentions other *participants* and the action is *volitional* and *telic*. It is not *punctual*, but because of the implied focus on the appropriateness of the expression, it is neither clearly temporally extended.

In the second example, FLOWING, writing is happening, that is it is of low *action*. No human actor is present so that *agency* is very low, neither are there further *participants*. Also, *affectedness* is low. There is no *individuated* object (although abstract objects, ideas and fantasies, are mentioned), which therefore cannot be

affected. Because there is no agent, what is happening is neither *volitional* nor *telic*. The process is non-*punctual*.

Transitivity analysis helps to separate different conceptual metaphors that drew on the same source domain. For example, the activity of moving appeared in different forms and with different grades of transitivity, as strongly volitional motion (for instance walking along a path) or as being moved (for instance riding on a roller coaster). These instances could be differentiated by their transitivity. As transitivity is not a mere ideational phenomenon but is tied to the linguistic construction of semantic meaning, this analysis included returning to the metaphorical expressions in order to check which components of transitivity were actually expressed or emphasized in the texts.

Finally, spatial primitives were described for the different metaphors. In EXPRESSING, the difference between inside and outside is dominant and the agent is seen as a CONTAINER of, for instance, feeling and views that can be externalized in the process of writing: EXPRESSING involves the primitive motion of OUT OF. The same is true for the example text involving "bubbling", although the conceptual metaphor FLOWING may or may not involve a motion OUT OF something.

Within the fourth step, the metaphorical concepts were compared in order to evaluate how similar they were in terms of transitivity and spatial primitives. In a few cases, two very similar concepts were combined into a single category, e.g. PAINTING and DRAWING.

Fifth step: Description of metaphorical systems. In a final step, metaphorical systems, that is systems of similar metaphors, were identified. This step was not planned in advance, but followed from the unexpected heterogeneity of the conceptual metaphors, which we wanted to cautiously systematize. A long list of conceptual metaphors might be difficult to use–possibly one of the reasons why some researchers use highly condensed conceptual metaphors, such as Sfard (1998) with her opposition of LEARNING IS ACQUISITION and LEARNING IS PARTICIPATION or Wegner and Nückles with the four classes of learning as self-regulation, acquisition, problem-solving and personality development (2015b).

In a procedure similar to the gradual integration of codes into an emerging theory in Grounded Theory (Straus & Corbin, 1990), we grouped metaphors according to comprehensive or coherent characteristics that became apparent during analysis. Following a similar claim by Lakoff and Johnson (1980), we call these groups "metaphorical systems." To jointly consider coherent metaphors may allow to carve out possible larger cultural tendencies and recurrent action and spatial qualities in conceptualizing complex target domains. Roughly half of the conceptual metaphors could be assigned to such systems. Whereas our focus is on the heterogeneity of conceptual metaphors, we present the systems as a possible coding and interpretation help.

Conceptual metaphors, transitivity descriptions and systems or conceptual metaphors were discussed in a team of three researchers until consensual interpretation was reached. Then, definitions of conceptual metaphors were written down in a short coding manual with a definition and one example for each category, similar to the Results section below. The manual also pointed out possible coding difficulties.

Coding was done on the German texts and in German. For the present paper, examples as well as concepts were translated by the authors.

After the code system had been developed, two trained coders independently coded the metaphors. One of them had been involved in the development of the system. After coding the first 20 texts, codings were compared and discussed among the two coders. The rest were coded independently. Some conceptual metaphors had to be added while coding this rest. Apart from that, coding continued independently for the rest of the texts.

Note that if the metaphor mentioned at the beginning of the text did not conform to any part of the further text, it was not coded because we wanted to understand the undergraduates' metaphors and in many cases, this required at least some explanation. As an example, the following student indicated that LIVING was their metaphor of choice, but explained it with different content, namely the conceptual metaphors of PROCESSING, BRINGING ON PAPER and PARTICIPATING: Writing is "… to live. One 'brings thoughts' on a piece of paper, whereby experiences, knowledge and events can be processed retrospectively. Likewise, people can participate in what is written. Thus, writing leads to people all over the world coming together in a certain way." The concept of LIVING clearly is a candidate metaphor, but it could not be understood with the help of this description.

3. Results

Following our goal to keep the rich content of metaphors in focus, we will first describe the conceptual metaphors identified in the material along their transitivity and spatiality characteristics. As in the coding manual, we will give one example for each metaphor. For the sake of brevity, only the more frequent metaphors of each category are described in the main text, at least two for each system. Descriptions of all metaphors can be found in the supplementary material. The examples presented in the following are the complete texts of the students and thus usually contain several metaphors. Words that were crucial for assigning a particular metaphor are underlined in the examples.

The analysis is organized along the four metaphorical systems we identified and each system section ends with a more abstract reflection.

Unique conceptual metaphors that do not belong to a metaphorical system are presented after the metaphorical systems. Tables 1 and 2 list all conceptual

metaphors in the sample, together with their transitivity characteristics and frequency.

Frequency and interrater agreement values are discussed after the qualitative descriptions.

3.1 Metaphors that imply a manifestation or solidification

The conceptual metaphors implying a solidification are (in alphabetical order) ASSEMBLING, BUILDING, CONNECTING, CONVEYING/ TRANSPORTING/ BRINGING ON PAPER, CREATING, DEPICTING, EXPRESSING, FORMING, HOLDING, PAINTING/ DRAWING/ SCULPTING, PROCESSING, SOLIDIFYING, SORTING, SQUEEZING, and STH FORMS (see also Table 1).

WRITING IS CREATING

Example: "creating one's own worlds. Through writing one can express one's own views, desires, dreams. You create your own world because you are responsible for what you write and how you write it."

This metaphor has, together with BUILDING and PROCESSING, the highest transitivity in our sample. Creating is a volitional, telic and usually nonpunctual activity. Its object is highly affected – usually, it did not even exist before the act. Thus, the actor has high agency. There is no other person implied. Interestingly, in the examples, often a world was created, not a THING. Apart from this, there is no distinct spatiality.

WRITING IS EXPRESSING

Example as above: "creating one's own worlds. Through writing one can express one's own views, desires, dreams. You create your own world because you are responsible for what you write and how you write it."

EXPRESSING SOMETHING is a conventional metaphor for writing in German. Its transitivity is rather strong. The actor is assigned a high degree of agency, yet it is characteristic of the EXPRESSING metaphor that there is no strong affectedness of the object of the action. Rather, the descriptions centered around the necessity and difficulty to express something without changing it. Usually, no participants except for the actor are mentioned, yet the action is volitional and strongly telic. In terms of space, the difference between inside and outside is dominant and the agent is seen as a CONTAINER of, for instance, feeling and views that can be externalized in the process of writing.

Table 1. Conceptual metaphors sorted by metaphorical systems, characterized in terms of transitivity from low to high.

Metaphor	Transitivity	Frequency	Metaphor	Transitivity	Frequency
Solidifying			Opening up		
ASSEMBLING	medium to high	1,3%	DISCOVERING	low	1,6%
BUILDING	high	1,0%	EMPTYING OUT	medium	1,0%
CONNECTING	medium to high	1,9%	LETTING GO	medium	7,7%
CONVEYING/ TRANSPORTING/ BRINGING ON PAPER	medium to high	1,0%	REVEALING	low	0,3%
CREATING	high	2,6%	Spatial movement		
DEPICTING	medium to high	1,3%	BEING MOVED	low	0,9%
EXPRESSING	medium to high	9,7%	FLEEING	medium	0,3%
FORMING	high	0,6%	FLOWING	low	3,9%
HOLDING	medium to high	7,4%	GOING ASTRAY	low	0,6%
PAINTING/ DRAWING/ SCULPTING	high	2,9%	MOVING	medium to low	0,3%
PROCESSING	high	1,9%	MOVING ABOUT	medium	2,9%
SOLIDIFYING	high	2,3%	STH MOVES	low	0,6%
SORTING	medium to high	2,6%			
			Vision		
SQUEEZING	high	0,3%	DISPLAYING	low to medium	0,9%
STH FORMS	low	1,9%	ILLUMINATING	low	0,6%
			MAKING VISIBLE	low to medium	2,9%
			REFLECTING	low	1,6%
			SEEING	low	1,3%

Frequency (percent values relative to all final codings) is indicated in the third and sixth column and will be discussed in the section about quantitative results. Note that frequency only relates to our sample and should not be generalized.

In this sense, EXPRESSING involves the primitive motion of OUT OF. EXPRESSING has little temporal extension. It is not punctual, but because of the implied focus on the appropriateness of the expression, it is also less clearly temporally extended.

WRITING IS HOLDING

Example: "The diary of memory. Writing is the transcription of thoughts, be they scientific or the private everyday kind. Thoughts are recorded as in a diary and information is preserved. If thoughts were not kept hold of, there would be no culture, no sense of community, no identity." (Note that the last sentence points toward a different understanding of writing, possibly PARTICIPATING. In the present example, however, no further metaphors were identified because the last sentence's statement is too abstract to be counted as a metaphor.)

This metaphor is partly similar to the metaphor of EXPRESSING, with the exception that the latter makes a distinction between a real object (the thought) and its expression that is its direct consequence. In the HOLDING metaphor, like in the MAPPING metaphor above, the goal of writing is to accurately copy and conserve what is there in a volitional action. Importantly, the two involved objects or THINGS are the same, even though they clearly are dependent on each other: A THING that is in the mind can only exist further when a THING is on the paper. The agency of the actor is low, the affectedness of the object is as low as possible (although it is not very individuated in our examples). The actor is alone; however, things can be kept hold of for other people in order for them to further act with or on them. The metaphor often draws on cultural techniques such as diaries or photographs.

WRITING IS PAINTING/ DRAWING/ SCULPTING

Example: "Painting pictures. Artists express their feelings and thoughts with pictures, this is also possible through writing."

In this metaphor, the writer maps the structure of a source object to a target object without affecting the general form of the source. The activity is that of a single person and telic and volitional. The object is highly affected and only comes into being through the writer's activity. Kinesis is clearly present, involving the hands and arms of the actor. Although the only participant mentioned is the writer, spectators are at least plausible in the context of this metaphor.

Space was not particularly present in the texts, although the actions imply a surface or a three-dimensional material. PAINTING and DEPICTING will result in THINGS. Compared to, e.g., BUILDING, which often mentions a world that is built, the THINGS in the present metaphor are smaller.

WRITING IS SORTING

Example: "Medicine. I don't often write privately for the fun of it. But if I am not well and thoughts spin round in my head, it helps me to write everything on a sheet of paper and to sort me out again."

This metaphor has a single participant who performs a volitional, non-punctual and telic action. There is an affected whole or object which did not exist in a strict sense before although its elements did. Agency is high. The metaphor has some overlap with BUILDING and PROCESSING but puts more emphasis on the combination of different things that are necessary to yield the outcome: The activity starts with many pieces that are combined in order to form a final product. Since the objects of SORTING mostly are internal, non-material objects (for instance thoughts and feelings), a manifestation and solidification of these objects into discernable and even touchable things is implied.

In our culture, SORTING is positively connoted in that the sorted state at the end of the process is valued higher than the state at the beginning. Furthermore, SORTING usually results in an arrangement or even tidiness, so that spatiality is implied in it (for instance being distant or near). However, none of the spatial aspects that Lakoff and Johnson (1980) mentioned appear in this metaphor.

Taking a step back

Many of the most common and conventional conceptual metaphors of writing described above and in the supplementary material belong to the overarching image that writing is an activity during which something immaterial or a previously nonsolid substance, mostly thoughts, is turned into touchable or visible things. These things are then ready to be further acted upon. These similarities are the reason why we suggest that these metaphors may belong to a solidification system.

In all cases, the final product gets a discernable form. Often, but not necessarily, there is something pre-existing like an idea or thought which is brought into the world. Although the metaphors frequently draw on the distinction between inside (where the material comes from) and outside (where the product is formed), this aspect is less prominent in some conceptual metaphors (like WRITING IS SORTING) than in others (like WRITING IS EXPRESSING). Also, the conceptual metaphors that feed into this system differ in their degree of transitivity. In some cases, the writer is an active person who acts on things or actively creates things (like in WRITING IS PAINTING), in other cases the writer mainly keeps things (like in WRITING IS HOLDING); in a few, the object is the agent (like IN WRITING, STH FORMS).

3.2 Metaphors that imply opening up a container or confined space

The four conceptual metaphors implying opening up are DISCOVERING, EMPTYING OUT, LETTING GO, and REVEALING.

WRITING IS LETTING GO

This is a somewhat heterogeneous conceptual metaphor, encompassing the fields of LETTING GO and LIBERATING/ BEING FREE.

Example: "A river full of thoughts. When you write, you let your thoughts run free. Not only the movements while writing are fluid, but also the thoughts that 'flow out' while writing."

Characteristic of this metaphor is that there is no strong agency; its focus is on a punctual, usually, but not strongly, telic and volitional action. The object that is let go is usually not very concrete and a plural object (thoughts, feelings). There are no other participants. Affectedness is on the side of the actor, not on the side of the object which changes its location setting the actor free. There is some overlap with the FLOWING metaphor discussed below, but LETTING GO includes an actor who initiates the action whereas there is no actor mentioned in FLOWING. The same holds true for texts that stressed the action of freeing something. In terms of space, there is a moment of separation: A LINK between something and the actor suddenly disappears.

WRITING IS REVEALING

Example: "A revelation. - one 'immortalizes' one's thoughts - allows one to share them with others - betrays something that belongs only to oneself - one opens oneself up."

The REVEALING metaphor is one of the rare metaphors that – following its inner logic – implicitly or explicitly involve at least one more participant than just the writer. In a stronger way than in other OPENING UP metaphors, there is a spectator implied, a someone whom something is revealed to. This second participant can be the writer her or himself who discovers something previously hidden (compare the WRITING IS DISCOVERING metaphor in the supplementary material), but mostly it is another person to whom thoughts or other objects are revealed. The example above points to the secret nature of thought, in a quasi-religious fashion an intimate inner realm is disclosed and immortalized, but also betrayed, by opening it up to others. Accordingly, agency, aspect, punctuality and volitionality are high, and the object – thought – is highly affected (e.g., betrayed, immortalized) unlike other metaphors in the same system. However, the object does not change, contrary to other metaphors where affectedness of the object is high, e.g., BUILDING or PROCESSING.

Similar to the CONTAINER being emptied, in REVEALING, there are THINGS that become apparent. One difference lies in the IN–OUT dimension – emptying turns things outside, whereas they remain where they are in revealing.

Taking a step back

This metaphorical system indicates that writers open up their thoughts (or their heads or souls) to others. It draws on a rather conventional understanding in Western culture of a person as a container with an inside and an outside. Agency is present and usually punctual, but affectedness is low. Sometimes, like in WRITING IS REVEALING, others are present, although mostly passive; there is no joint action. Contrary to the metaphors in the solidification system that also imply the HEAD IS A CONTAINER metaphor, the content (thoughts, ideas, emotions, problems) is not necessarily turned into a stable and workable object.

3.3 Metaphors that imply a spatial movement

The seven conceptual metaphors implying spatial movement are FLEEING, FLOWING, GOING ASTRAY, MOVING, MOVING ALONG, BEING MOVED, and STH MOVES.

WRITING IS FLOWING

Example: „a river. Thoughts form, are further developed and then ‚flow' onto the paper. If possible, a continuous coherent text is formed."

FLOWING describes writing as something happening, often implying an unblocked spring and without mentioning participants. No actor is present so that agency is very low. Also, affectedness is low. Although there is something like a concrete and individuated product of writing, it does not suffer from the action. Furthermore, as there is no agent, what is happening is neither volitional nor telic, at least in a strong sense. The event happening is, however, not erratic, it results in, for instance, a form or a flow. The process described is clearly non-punctual and spatial extension is high as there is a continuous PATH of movement.

WRITING IS MOVING ABOUT

Example: "Writing is like a hurdle race. You work your way forward step by step and then reach your goal. For example, if you have to write a term paper, you get a topic at the beginning. You can compare the topic with the start. During the writing many hurdles come up to you, which you have to overcome. But in the end you reach your goal."

Metaphors of this category are distinguished by a spatial motion from one to another location. Often (and as in the example) the step-by-step character of the motion is emphasized. The activity is volitional, usually telic and nonpunctual. There is low affectedness – the world or scene and the actor stay the same. Objects and others are absent. There is a clear PATH in this metaphor, but no other spatial aspect.

Taking a step back

These metaphors highlight a spatial motion or movement of the person and draw their main structure from the conventional image of someone or something moving in a space or world. A core idea is that of a PATH, that is a continuous trajectory in this world or space, and usually, the activity consists of repeated elements. In these metaphors, there is only one person present and even if objects are implied, they are not the targets of the action. Agency is present and usually nonpunctual, but affectedness is low; rather, the world and person seem to stay as they were, except for the person's or the ideas' location. Demarcation from other systems is not always easy because other metaphors include movement or motion, too; remember that the systems are an interpretation help and do not identify true roots.

3.4 Metaphors that imply the visual domain/seeing

The five conceptual metaphors in this system are DISPLAYING, ILLUMINATING, MAKING VISIBLE, REFLECTING, and SEEING.

WRITING IS MAKING VISIBLE

Example: "help to visualize thoughts and make them visible. By writing you think, ponder and assemble thoughts."

The linguistic realizations of this concept are often not very expressive. (Similarly vague metaphors in other systems are FORMING, STH FORMS and SOLIDIFYING). They indicate a volitional and telic, mostly punctual action. There is no change, neither in the actor nor in the object, only in its accessibility. Consequently, the actor does not display high potency. MAKING VISIBLE implies individuated THINGS but beyond that no special spatiality except for distance.

WRITING IS REFLECTING

Example: "a mirror. Up to a certain point, writing, or the written word, reflects the author and their thoughts. It becomes clear how a person wants to be perceived and to what extent they want to share thoughts with us. No text can be seen independently from the individual and the circumstances in which it is written. Up to a point, it reflects interpersonal things..."

Reflecting is a rather common expression in everyday language. Of the four members of the seeing system, it has the lowest transitivity, and the example above is a good illustration: Although the author "wants" something, reflection is not done, but happens. Reflection leaves the object unaffected. It is punctual and more or less nontelic and nonvolitional. It implies distance (as all seeing metaphors).

WRITING IS SEEING

Example: "Self-help. Writing makes it easier to recognize connections and to look at the whole picture."

In our culture, seeing is a very important domain of comparisons and metaphors, especially with respect to knowledge and insight. Although the metaphor is frequent when reading is addressed (Scharlau, Körber & Karsten, 2019), it is not very commonly used for writing. The combination with "the whole picture" (WRITING IS PAINTING/ DRAWING), seeing leading to an overview over different things or aspects, seems to be distinctive for this conceptual metaphor[4].

Seeing and looking are volitional acts. They might be punctual (as in recognizing), but non-punctual as well (as in looking at something). In the above example, seeing is telic, but it needs not to be so. The object of seeing is usually not affected by seeing itself. Characteristically, there can be only one participant. In our culture, metaphors of SEEING are very often highly positively connoted because of the mentioned connection to insight and understanding. In the above example, this connotation is indicated through the expression of self-help and possibly also through the adjective "whole" which is positively connoted, too. Seeing is highly spatial and includes a distance. Interestingly, the front-back distinction which is rather distinctive of seeing is never mentioned in the use of this metaphor: The possibility that some things will remain undiscovered goes unnoticed.

Taking a step back

Seeing metaphors are very common in our culture, especially for processes of understanding and in the domain of knowledge. Similar to the opening and the movement metaphors, the object of seeing is not changed, it is rather made accessible or available by the act of seeing. Furthermore, transitivity is very limited. Although one could look at objects closely and actively, this is usually not emphasized in the metaphors present in our material.

3.5 Other metaphors

There were a number of conceptual metaphors in our sample that could not be assigned to a conceptual system (see Table 2). Three of them were rather frequent and are therefore described in the following in alphabetical order.

Table 2. Conceptual metaphors not assigned to metaphorical systems, characterized in terms of transitivity from low to high.

Metaphor	Transitivity	Frequency	Metaphor	Transitivity	Frequency
ACHIEVING	medium	1,6%	INFLUENCING	High	1,6%
BEING CONFINED	low	3,2%	LEARNING	low to medium	0,9%
BROADENING/ IMPROVING	medium to low	0,6%	LIVING	Low	0,3%
CHOOSING	low	0,3%	MAKING ACCESSIBLE	medium to high	0,3%
CLEANING	high	0,6%	OVERCOMING AN OBSTACLE	medium to high	1,6%
DEVELOPING	low	0,6%	PARTICIPATING/ LETTING PARTICIPATE	Medium	1,6%
DEVELOPING STH	high	1,3%	PLAYING	Medium	0,3%
DRAFTING	medium	1,6%	PUZZLE-SOLVING	medium to high	0,3%
DREAMING	low	0,6%	RECEIVING	Low	0,3%
EXERTING ONESELF	medium to high	1,6%	RELAXING/ CALMING/ ENJOYING	medium to low	2,6%
FOCUSING	medium	0,9%	REPRODUCING	Medium	0,9%
GRAPPLING WITH STH	medium	0,6%	TALKING/ COMMUNICATING	Medium	4,5%
IMMERSING ONESELF	low	0,9%	WORKING	High	0,6%

Frequency (percent values relative to all final codings) is indicated in the third and sixth column and will be discussed in the section about quantitative results. Note that frequency relates only to our sample and should not be generalized.

WRITING IS BEING CONFINED/ BEING DEPENDENT

Example: "Sculpting. You have a rough idea or idea of what you want to write, but in the course of writing you recognize your own limits, whether in the knowledge of a subject or the time and zest you can spend on a text."

This metaphor is one of the cases of very low kinesis in our system: Its focus is on non-action or an action that is made impossible or changed. The event is nonpunctual but neither telic nor voluntary, and the one affected (limited) is the actor, not an object. The main impression is that of being confined. The cause of the restriction is usually vague or even not mentioned at all. This metaphor does not include a clear spatiality although limits or confinement and links are present.

Interestingly, this metaphor sometimes goes along with LETTING GO/ LIBERATING which is its opposite, indicating an ambiguous or Janus-faced manner. A single case in which the writer described writing as being led was also coded in this category.

WRITING IS RELAXING/ GETTING COMFORTING/ ENJOYING

Example: "Writing is like relaxation. When writing I am just me and the blank page of paper in front of me. Thus, I can give free rein to my thoughts when writing (creatively) and see where they take me (perhaps also in a completely different direction than I first thought). This gives strength to get new energy for other things."

This is a heterogeneous category. It is difficult to say whether it is truly a conceptual metaphor, but there was quite a variety of texts in which the relaxing, comforting and enjoyable aspects of writing were emphasized. It is difficult to characterize the transitivity of this category, but the least that can be said is that agency is low or at most medium and that the object of the action is the actor. No others participate.

WRITING IS TALKING

Example: "Talking to a friend. There are things that sometimes you just have to tell someone. There isn't always someone nearby who understands you. Writing can help to deal with problems, etc."

Although speaking is often mentioned as a metaphor, in our material it is mostly depicted as a one-way act, that is somebody speaking out his problems or thoughts. The other person does not talk back so that, strictly speaking, in most TALKING metaphors, there is only one participant. There is agency including a strong telic aspect and usually volitionality, although the affectedness is rather low (apart from the effect of speaking out on the actor).

3.6 Quantitative analysis

This section reports quantitative data. Besides an index of interrater agreement, we will also discuss the frequencies of the conceptual metaphors (which were reported in Tables 1 and 2) and of the metaphorical systems.

The metaphors were coded independently by two coders who reached an agreement of 84.97% and an interrater reliability of $\kappa = .85$ (Cohen's κ) which can be

regarded as very good agreement. This calculation does not include the first 20 metaphors that were discussed among the coders.

Overall, the 143 texts were coded with 651 metaphors with 0 to 7 metaphors per text.

Frequencies of codings are given in Tables 1 and 2 as percent values of final codings which were done by the second coder. Because of the large number of conceptual metaphors most frequencies are very low. Only few conceptual metaphors reach at least 3% of the codings. These are – in order of decreasing frequency – WRITING IS EXPRESSING, WRITING IS LETTING GO/ LIBERATING, WRITING IS HOLDING, WRITING IS TALKING/ COMMUNICATING, WRITING IS CONVEYING/ TRANS–PORTING/ BRINGING ON PAPER, WRITING IS FLOWING, and WRITING IS BEING CONFINED OR DEPENDENT. These few frequent metaphors show impressive heterogeneity: They include doing as well as not being able to do something, seeing as well as talking and forming, letting things run as well as holding them.

Figure 1 depicts the frequency of the four metaphorical systems and the further conceptual metaphors. Overall, the figure indicates that teachers and researchers should expect a considerable variety of metaphorical understandings of under–graduates. Since we studied a convenience sample of undergraduates with no structured writing curriculum, this conclusion should not be overstated; it agrees, however, with studies in other samples (e.g., Shaw & Mahlios, 2014).

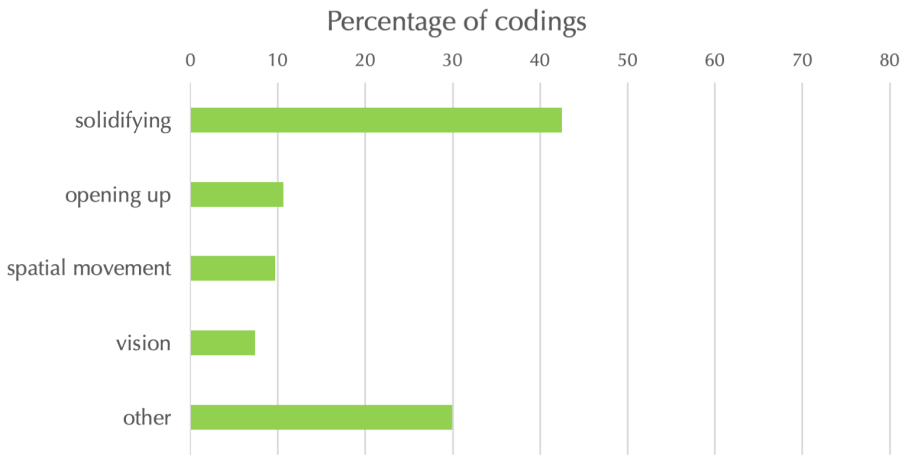

Figure 1. Frequency of codings in the different metaphorical systems. The x-axis gives the percent values relative to the final codings.

Solidification metaphors cover 40% of all codings. This might indicate that writing is most often understood as handling things and conforms with other studies, for instance, Shaw and Mahlios who reported that the most frequent metaphors of reading and writing in a sample of adult literacy students focused on handling parts. However, we have to note that, in our study, there were many more different conceptual metaphors in the solidification group than in the others which might account for their large proportion.

Note that our aim is not to indicate how frequent the metaphors "are" – this could not be done with our sample. We present the data because hypotheses might be gained from them and inform future studies, for example that most metaphors are comparably rare and few, some conventional metaphors are frequent or that solidification metaphors might be, overall, the more usual ones.

4. Discussion

Based on the idea that metaphors may index students' implicit conceptions of academic writing, we identified conceptual metaphors produced by a large convenience sample of undergraduates in short texts. Taking a theory-driven approach, we analyzed the metaphors with respect to the implied action quality (transitivity) and spatial primitives. We found that the metaphors draw from a wide and variable range of source domains. We regard this heterogeneity as the main finding of the present study. It clearly contrasts with studies that condense conceptualizations to very few categories such as writing as an open vs. closed space (Levin & Wagner, 2006).

4.1 Writing beliefs and transitivity

Comparing our results to the writing beliefs identified by White and Bruning (2005), we have to ask whether the metaphors fit into their conceptualizations. This is certainly true for some of them. CONVEYING/ TRANSPORTING/ BRINGING ON PAPER, for instance, directly matches the transmission view. Also, there is a high correspondence to HOLDING and DEPICTING which also imply an unchanged object. A match to the transactional view is more difficult to identify, but certainly, present metaphors that involve personal involvement (e.g., DEVELOPING, LEARNING). Metaphors that involve a repeated action on objects (e.g., BUILDING, FORMING, PAINTING) also show some correspondence to the transactional view, but we noted that although the verbs imply repetition, the did not seem to be important in the explanations. Furthermore, the basic characteristics of many metaphors we identified are not covered by the two beliefs. This is characteristic of the metaphors in the opening up and movement system and many of the metaphors that were not assigned to a system. That is, there seems to be more to understandings of writing than the two beliefs capture.

We believe that the concept of transitivity spells out one basic difference between the transaction and transmission views. Transitivity was more varied than the distinction between two beliefs implies. Although some of our metaphors implicate high agency – most notably BUILDING, CREATING and PROCESSING –, most of them are medium or even low in transitivity, indicating that the actor does something (such as HOLDING or SORTING) but does not strongly affect the object of the action. Affectedness may even be on the side of the actor, such as a reduction of tension via LETTING GO. Low transitivity in the sense of Hopper and Thompson (1980) is also indicated by the presence of mostly only one participant, even in metaphors that would allow for the involvement of or imply others (such as BUILDING and OPENING UP). In some cases, the action is only initiated and continues on itself (for instance REVEALING, OPENING UP), and many metaphors imply short activities. Thus, both overall and individually, the metaphors convey the impression that writing needs no strong agency. Writers' understandings that show limited agency have been reported in earlier studies on approaches to writing (most importantly Bruning & Horn, 2000; McCune, 2004; knowledge-telling sensu Bereiter & Scardamalia, 1987), but the present findings indicate an even stronger and phenomenologically more varied lack of agency that is interesting both theoretically and pedagogically[5].

However, we also want to note that elaborated understandings of writing may well include elements of weak transitivity, as, for instance, in what Galbraith called the romantic position of writing where new ideas are "discovered" by writing (1999). Many expert writers know that writing depends on what is called *kairos*, that is the lucky moment that cannot be enforced but has to be waited for. An elaborated concept of transitivity and agency in understanding of writing would have to include such sophisticated aspects.

With regard to space, we again found a more varied picture than, e.g., the distinction between open and confined space proposed by Levin and Wagner (2006). Overall and unexpected both based on the theoretical account of spatial primitives (Mandler, 2012) and the spatial dimension proposed by Lakoff and Johnson (1980), spatial aspects of the metaphors were not conspicuous. Of Lakoff and Johnson's dimensions, only IN–OUT was prominent, often as a CONTAINER metaphor, that is, content in the head or person which has to be turned outside. Of the spatial primitives, THINGS are relevant in the first metaphorical system (solidification and manifestation). IN or OUT, CONTAINER, LINK and LOCATION of an action are also frequent and partly reflect the distinction between an open and a closed space. PATH and MOVE are characteristic of many conceptual metaphors in the third movement system. Overall, spatial primitives seem to be less informative, especially less discriminative than the transitivity aspects.

4.2 Comparison to theoretical approaches

This lack of strong transitivity mentioned above does not only depart from the model of two writing beliefs – it is generally unexpected on theoretical and empirical reasons. Both cognitive and sociocultural approaches stress individual agency.

As apparent from the description of the metaphors and the summary in the Introduction, the correspondence of the undergraduates' conceptual writing metaphors with the two main theoretical approaches is low. None of the specific aspects of the sociocultural view is clearly present: Most metaphors are medium or low in transitivity and do not mirror the tension between being either the object or the subject of highly transitive actions (although BEING RESTRICTED echoes the former). The metaphors that involve manifestation and solidification of ideas and thoughts are compatible with metaphors of giving and receiving, but they almost never address this second step; the rare metaphor WRITING IS PARTICIPATING/ LETTING PARTICIPATE is the only exception. The metaphors that imply a process of opening up a container or confined space are compatible with metaphors that conceptualize other people as co-present, especially as spectators, but again, the co-presence of other people is rarely named. In the metaphor, WRITING IS FLOWING that would be compatible with the notion of restriction and guidance of actions by a force located outside the acting person (e.g., in talking about banks or barriers) these forces were not found in the present sample. Quite the contrary, flow was rather the opposite, an unrestricted motion. The rare metaphor WRITING IS TALKING corresponds with conceptualizing cognitive processes as speaking and dialogue.

The correspondence with the cognitive view on writing is also low. The solidification metaphors broadly capture the notion of writing as problem-solving, that is, turning an initial state into a desired end state. For instance, EXPRESSING and MAPPING include the problem of mapping internal content with externalized words. Many (though not all) solidification metaphors indicate temporally extended processes, parallel to cognitive theories. Individual actions also are often present in many of the metaphors, though agency is often medium or low. Planning is very important in most psychological writing theories but goes unmentioned in the texts. Quite the contrary, many metaphorical concepts indicate few or no planning, such as EMPTYING OUT, LETTING GO, FLOWING, REVEALING, DISCOVERING, and SEEING. Furthermore, only few metaphorical concepts include a complex or recursive action, whereas many consist of a single action that is executed only once, most notably in REVEALING or DISCOVERING. Of the many different processes in psychological models, only one is clearly captured in the conceptual metaphors: translating. It appears as transferring something to a different place (from inside to outside) or into a different format (from thoughts to sentences).

To sum up, in the system of metaphors derived from a sample of undergraduate students, there is little conceptual overlap with conceptualizations of writing in

sociocultural and psychological theories. The undergraduates we studied used identifiable metaphorical concepts, parts of which even can be summarized in metaphorical systems, but these bear only a slight resemblance to the ideas discussed in science. There is slightly more agreement with the psychological understanding of writing than with the sociocultural one, mostly driven by the fact that many conceptual metaphors include only one actor. However, given the impression that the agreement is low even for the psychological view, this difference can be confidently neglected.

4.3 Limits

Before addressing topics for further research, we want to draw attention to the limits of the present approach. Firstly, we do not claim to have captured the full width of possible conceptual metaphors: We studied German undergraduates with limited exposure to and no structured curriculum in academic writing. It can be expected that both conceptual metaphors and their frequency change with writing experience or academic enculturation.

Secondly, undergraduate texts were very short and contained few explications. This might induce errors in interpretation. Further studies could attempt at elucidating more of the semantic content of metaphors by asking undergraduates to orally elaborate on their metaphors and specifically on what they catch well on the one hand and miss on the other hand (e.g., Armstrong, 2015).

Furthermore, we disregarded contextual influences. This might not be critical when the goal is to identify possible metaphors and not to diagnose individual students' understanding – we do not claim that the texts reflect the true metaphors of the undergraduates. Our focus is not on individual conceptualizations but on metaphors as a cultural resource for understanding the complex activity of writing. However, the actual use of metaphors will depend on rhetorical situations and how these are interpreted and further studies should try to identify which metaphors people use in which situations.

4.4 Future steps and conclusion

We present the collection of conceptual metaphors to be used as an empirical tool in future studies. Our surmise in the Introduction that subtle and possibly implicit conceptualizations of academic practices might prove interesting has stood the empirical test, most notably in the finding that the writing metaphors of the undergraduates demonstrated overall low to at most medium agency. Where can we go from here? Pursuing the goal to understand how more and less successful writers may differ from each other and how academic writing might be improved, future studies might test, for instance, whether, and if so, how, the composing processes of students holding more or less transitive views of writing differ. It stands to reason – but also calls for an empirical test – that students who view

writing as FLOWING may approach academic writing tasks differently than students who see writing as HOLDING, EXPRESSING, OR COLLECTING or those who conceive it as BUILDING or TALKING. One advantage of such studies is that, different from the conceptualizations identified by questionnaires, they stay close to or even are part of the language used in everyday talk about academic practices and tasks.

An ultimate goal of much praxis-oriented writing research would be to establish whether (and if, how strongly) individual preconditions influence the quality of academic texts. Based on the studies mentioned in the Introduction that show that implicit beliefs can influence writing quality (e.g., Vermunt & Vermetten, 2004; White & Bruning, 2005), such influences may exist for metaphors of writing. Bearing in mind, however, that the influences on writing quality or writing processes are multifaceted and that different influences will possibly interact, we expect that they will be rather small and can only be established in large studies.

Concerning practical applications, we would like to draw attention to the possibility to explicitly develop conceptual metaphors to establish a more helpful understanding of academic writing. Wan (2014) has shown that discussion of metaphors is a useful tool for broadening the understanding of writing, reflecting critically about writing, and fostering positive writing beliefs. Many metaphors in our sample might require only slight alterations to reach a better understanding of writing. For instance, SORTING often came along very simply, but structuring pre-existent content is an important aspect of academic writing. That is, this metaphor captures an important aspect of writing that may only have to be elaborated with respect to the affectedness implied, the structures that might be established via sorting, and the agency of sorting. An area where existing metaphors can and should be elaborated and complemented is the sociocultural domain. Metaphors like WRITING IS PARTICIPATING/ LETTING PARTICIPATE and WRITING IS TALKING already implicate an interaction with other people and almost all of the metaphors that include solidification allow for co-action. Using class discussions, for instance, the social character of these metaphors and of writing could be made more explicit.

We finally want to draw attention to the fact that metaphors are omnipresent in academic discourse and shape construction of academic realities. Even if no strong influences of metaphors on writing strategies or text quality could be established, research like the present study may help academic staff to reflect on how they construct and present writing in everyday academic discourse.

Notes

1. Just like everyday thinking about writing, scientific models of writing do not go without linguistic representations of the modeled activity and use metaphorical conceptualizations of their object of study that oftentimes are taken for granted and stay unquestioned. If metaphors serve the function of a tool, they can be considered useful if they fit the structure of the target domain to a certain

degree. This does not mean, however, that any of the scientific perspectives with their respective metaphors necessarily make correct claims about their target domain and uncover the "real" structure of writing processes. Yet, to explicate (metaphorical) conceptualizations of writing in the two scientific perspectives enables us to compare both the match of students' metaphors with these scientific views and the resulting implications for writing pedagogy.

2. Because we did not aim at generalizing across samples, did not want to prime the students to information irrelevant for our study and wanted the text to be as anonymous as possible, we did not record personal information such as age or gender.
3. We also asked for a metaphor of reading and, in the teacher training seminar, for a metaphor of motivation. These were/will be analyzed in independent papers (Scharlau, Körber & Karsten, 2019).
4. SEEING implies complementarity of writing and reading. Although this stands to reason, neither aspect was elaborated in the student metaphors. One may speculate that these aspects will be more prominent in the metaphors of expert writers.
5. One might surmise that the students' understanding results from a view of writing that emphasizes genius in writing and inadvertently influences the students' notion of what a good writer is. Such an understanding might be fostered by literary education focusing on a canon of (national) literature. The latter is not typical for the German high school which most our students completed, but it is well possible that the dominancy of faintly transitive metaphors has to do with the way writing is presented and taught in high school in Germany. Note that we do not make claims respecting the causes of our findings; our focus is on the discrepancy between students' conceptualizations and theoretical approaches to explain and foster academic writing.

Author contributions and acknowledgement

Ingrid Scharlau conceived the study and collected the data. Ingrid Scharlau and Andrea Karsten collaboratively devised and carried out the identification of conceptual metaphors and transitivity analysis. Katharina Rohlfing analyzed spatial primitives. Ingrid Scharlau, Andrea Karsten and Katharina Rohlfing wrote the manuscript. We express our gratitude to Anastasia Schulz and Miriam Körber for their help in establishing the conceptual metaphors and to Miriam Körber for her part in coding the texts.

Supplementary material

The supplementary material can be found at the Open Science Foundation: https://osf.io/5g6s2/

Conflict of Interest Statement

The authors declare that there are no personal, professional or financial relationships that could potentially be construed as a conflict of interest.

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