

## Typology of children media users

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### Abstract

Research about children's media use is often concerned with the effects of one particular medium. There is rather little research about more general media diets in terms of their diversity and the resulting outcomes. Against the theoretical background of media repertoire approaches, we developed more general types of children's overall media use. We analyzed standardized interviews with children as part of the MIKE-2017-project in Switzerland. Drawing on a representative sample of 448 primary school children of the French-speaking part of Switzerland, we developed a typology of children media users based on their media diet, referring to a media repertoire approach. Data revealed three media use patterns labelled as "visual drifters" who dominantly use screen media, "modern diversifiers" who use a wide variety of media, and "traditional offliners" with a narrow repertoire. Contrary to often-expressed concerns, "modern diversifiers" frequently engage in non-media activities compared to the other groups. Results show that it is not only essential to concentrate on the children's frequency of particular media usage but also on children's media diets or repertoires.

### Keywords

media users, typology, displacement hypothesis, media repertoires, cluster analysis, Switzerland

## 1 Introduction

Media is an essential part of adults' everyday lives and of children's living environments (Livingstone, 2009, 2014), as terms and expressions like "mediatization" (Livingstone, 2009, 2014) or "permanently online, permanently connected" (Vorderer, 2015) imply. There is ongoing debate in academia as well as in public on which media children should use and how much time they should spend on media use, as diverse media contents and extensive media use are considered harmful for children (Chang & Bushman, 2019; Chen & Shi, 2019; Domoff, Borgen, Foley, & Maffett, 2019; Livingstone, 2007). On the one hand, children need to use media and create their own media experiences to acquire essential skills such as media literacy. On the other hand, media use might be connected to adverse effects such as obesity, or the impairment of cognitive performances or personality traits (Harrison & Liechty,

2012; Kwan et al., 2020; Livingstone, 2007; Strasburger, Jordan, & Donnerstein, 2012). In this paper, we argue that attention on the risks of media use should not be neglected, but we also aim to show that especially the variety of media children use matters, not just the amount of time they spend on media use in general. We argue that some media repertoires (based on the media use frequencies of different media) seem to be problematic while others are not, even though media users of both patterns might use media very frequently. We therefore broaden the perspective by analyzing media use frequencies of different media which we here refer to an individual media diet or media repertoire (Hasebrink & Domeyer, 2012; Taneja, Webster, Malthouse, & Ksiazek, 2012). To indicate children's media use types, we draw from the repertoire approach (e.g., Hasebrink & Popp, 2006; Oblak Črnič & Luthar, 2017) and the media lifestyle approach (van Kruistum, Leseman, & de Haan,



2014). These media use types are connected to non-media activities to analyze to what extent frequent media use per se or the diversity of a specific media repertoire is related to non-media activities. In this sense, we link to the ongoing debate (e.g., Braumüller, 2020; Vilhelmson, Elldér, & Thulin, 2018) about the displacement hypothesis (e.g., Meyersohn, 1968). We therefore ask if a large variety of frequently used media by children leads to a displacement of non-media activities, or, in contrast, if it is connected to children's enhanced activity in general (e.g., Meyersohn, 1968). Albeit both hypotheses were developed in the 1960s, they appear to provide still a fruitful theoretical background in media usage research (e.g., Braumüller, 2020; Vilhelmson et al., 2018).

The relevance of our research interest finds support in the evidence on adverse effects of media use for children (e.g., Chang & Bushman, 2019; Chen & Shi, 2019; Domoff et al., 2019; Harrison & Liechty, 2012; Kwan et al., 2020; Strasburger et al., 2012), especially concerning particular media content or the overall time spent on media use. How children spend their leisure time is often an essential indicator of their physical, cognitive, and social development and well-being (e.g., Coatsworth, Sharp, Palen, Darling, Cumsille, & Marta, 2005; Shikako-Thomas et al., 2012): Previous research has shown that children use media to play with others, entertain themselves, learn, and engage in prosocial activities (Koenitzer, Jeker, & Waller, 2017; Prot et al., 2014; Strasburger et al., 2012). Therefore, a multitude of motives and needs can be satisfied by media use, as outlined by the uses and gratifications approach (Katz, Blumler, & Gurevitch, 1973; Lev-On, 2017; Rubin, 1983). Derived from this perspective, one could assume that children develop strategies to gratify their learning or entertainment needs by repeated instrumental media use. However, through selective media usage, children not only passively satisfy needs (e.g., escapism by immersion into fictional programs) but also benefit by improving their skills, especially at preschool age or older. In this regard, media usage is valuable for

children's education, depending on their age and the media content they use (Adelantado-Renau, Moliner-Urdiales, Cavero-Redondo, Beltran-Valls, Martínez-Vizcaíno, & Álvarez-Bueno, 2019; Anderson & Subrahmanyam, 2017; Radesky, Schumacher, & Zuckerman, 2015).

Beyond these positive effects, children are also exposed to numerous threats when they use media (e.g., Chang & Bushman, 2019; Chen & Shi, 2019; Domoff et al., 2019; Harrison & Liechty, 2012; Kwan et al., 2020; Strasburger et al., 2012). Children show the risk of underdevelopment, such as poor sensorimotor skills or the inability to build and maintain social relationships, due to inadequate or too early use of media (e.g., Radesky, Schumacher, & Zuckerman, 2015). They might also be confronted with cognitively and emotionally challenging content such as media violence (Bushman & Huesmann, 2006; Chang & Bushman, 2019), or pornography (González Ortega & Orgaz Baz, 2013). Furthermore, children's media use has been discussed as a risk for physical health such as child obesity (Harrison & Liechty, 2012; Strasburger et al., 2012), or mental health such as cyberbullying (Erdur-Baker, 2010; Kwan et al., 2020). Cyberbullying might even be connected to suicidal behavior, as a meta-analysis by John et al. (2018) shows, most probably because children have not yet developed a distinct sense of Internet-related risks (Koenitzer et al., 2017).

In this study, we focus on a specific, less obvious class of effects of media usage on children, namely the impact of their media usage behavior on non-media activities in their free time. Because of the use of media, children might devote less time to engage in non-media activities, such as maintaining (offline) social relationships with family and friends or activities that involve physical activities being essential for children to develop physically, socially, and cognitively (e.g., Biddle, Ciaccioni, Thomas, & Vergeer, 2019; Burris & Tsao, 2002; Coatsworth et al., 2005; Shikako-Thomas et al., 2012).

The fear that media usage is replacing real-world relationships is frequently de-

bated in society and in academia (Radesky et al., 2015). Against this background, there has been ongoing discussion on how to teach media literacy to children (e.g., Anderson & Subrahmanyam, 2017; Wartella & Robb, 2008). Despite acknowledging the potential dangers of media, it is probably not useful to prevent children from using media in general, since children need media experiences to acquire media literacy; thus, they have to use media (Aufderheide, 1993; Potter, 2013). In this sense, media literacy comprises assumptions about when children should start making their own media decisions such as when to begin using smartphones or the Internet (Koenitzer et al., 2017), how long or frequently they should use specific media, and what type of content they should access (Strasburger et al., 2012). Questions of media literacy also affect the question of how much different media children should use and how frequently – this is the focus of our paper.

We especially link to the “displacement hypothesis” and the so-called “The more-the-more hypothesis” (e.g., Meyersohn, 1968; Mutz, Roberts & van Vuuren, 1993). In contrast to previous studies, we do not only focus on the frequency of using specific media but also the variety of frequently used media as a second aspect of the discussion. We link the typical repertoires of media used by children to their non-media leisure activities (e.g., Hasebrink & Hepp, 2017; Hasebrink & Popp, 2006; van Kruistum et al., 2014).

In contrast to previous studies that were dedicated to obvious positive and negative effects of media use on children, we focus on the description of less obvious side-effects of media use. Furthermore, we aim at describing the impact of children’s media usage on their non-media free-time activities without judging their behavior. Nevertheless, as outlined above, it is important to keep in mind that any media repertoire can be linked to a multitude of positive and negative effects that should not be neglected.

### 1.1 The more-the-more hypothesis vs. the more-the-less (displacement) hypothesis

Both hypotheses have been primarily discussed in the context of traditional mass media (e.g., Meyersohn, 1968; Mutz et al., 1993). They describe two oppositional consequences of extensive media use or the usage of new media: The displacement hypothesis (or “the-more-the-less hypothesis”) suggests that the more children use media, the less they engage in non-media activities (Mutz et al., 1993). Contrary to the displacement hypothesis, the so-called “the-more-the-more” hypothesis assumes that media use and engagement in non-media activities depend on alternative explanations. Consequently, media use and non-media activities do not cannibalize each other but are instead the result of the children’s general activity levels, their motivation, or their socioeconomic background (Meyersohn, 1968). Hence, extensive media use can correlate with high engagement in non-media activities because some children may simply be more active than others. This hypothesis has already been investigated by Meyersohn (1968), who assumed a socio-economic influence on the relationship between media use and non-media activities. Against the background of the work by Jahoda, Lazarsfeld, and Zeisel (1933/2017),<sup>1</sup> Meyersohn (1968, p. 103) pointed out that “[...] if an individual has the energy, interest, motivation, and so forth to pursue one leisure activity, he is likely to be motivated to pursue others as well.” Therefore, unlike the displacement hypothesis, the more-the-more hypothesis assumes a positive association of time spent with media and time spent on non-media activities. The reason why media use might not necessarily take away time from other activities is that many media activities can be done while doing other activities as well, or as Mutz et al. (1993) showed, media activities more likely displace other media activities than non-media activities (e.g., media-re-

1 The work was first published in 1933 in German.

lated gratifications can be obtained better by the use of new media).

However, research on these hypotheses mostly focus on particular media (e.g., Mutz et al., 1993), or a class of media, such as computer media (Endestad, Heim, Kaare, Torgersen, & Brandtzæg, 2011), and they just concentrate on the amount of time spent on media activities, not on the variety of media use. In contrast, research on media usage repertoires and their effect on non-media activities is rare. In this paper, we do not only analyze how the total time spent on media is connected to the frequency of non-media activity engagement but also whether the variety of frequently used media can be related to the frequency of non-media activities.

## 1.2 Media use repertoires

Frequently, researchers, educators, and politicians focus on single media and their adverse effects on children and adolescents (Browne, Thompson, & Madigan, 2020; Chang & Bushman, 2019; Domoff et al., 2019; Kwan et al., 2020; Livingstone & Helsper, 2013; also see Oblak Črnič & Luthar, 2017), such as the dangers of gaming, using the Internet, or consuming violent television content. Single media approaches show in great detail how specific elements of particular media lead to diverse effects. However, these approaches are somehow biased toward one particular medium or content, isolating its uses and effects from other media uses and effects. Since most children do not heavily and solely use one specific medium or media content, it seems to be fruitful to broaden the perspective toward media use repertoires and effects: Not only Swiss children use many different media (e.g., Genner, Suter, Waller, Schoch, Willemse & Süss, 2017), the same holds true for Germany, for example (mpfs, 2020). The media repertoire approach comprises media uses allowing us to analyze how far specific combinations of frequently used media may be more or less advantageous. However, we cannot assess in detail which particular characteristics of certain media are potentially harmful.

There exist many approaches to the combined use of specific media, such as the media repertoires approach (Hasebrink & Popp, 2006) or the media lifestyle approach (van Kruistum et al., 2014). These approaches take a broader perspective on media use, integrating the use of diverse media into everyday life routines or connecting it to social characteristics (e.g., van Kruistum et al., 2014). As stated by Hasebrink and Popp (2006, pp. 373–374), “[...] media repertoires can be understood as an integral part of lifestyles, and they have to be interpreted concerning their practical meaning.”

In our study, *media repertoire* is a broad concept. We use this broad definition of *media use repertoires* as a set or combination of frequently used media. These patterns may have more or fewer facets, depending on how different or similar media are used frequently.

Against this background, we pose two research questions:

RQ1: Which types of media users can be identified in a representative sample of primary school children in Switzerland based on their media use repertoires?

In considering the potential adverse effects of frequent media use, we further ask:

RQ2: To what extent do those media user types differ concerning non-media activities?

The first research question deals with the identification of media user types. The second one draws on the underlying problem regarding the extent the frequently used media is connected to varying frequencies of engagement in non-media activities. Therefore, we assume that possible adverse effects such as poor non-media social relationships, or limited physical activities may not only be based on the usage of one specific medium but also that these correlates relate to the diversity of media use patterns of children.

Therefore, regarding the debate about the displacement thesis, we assume that it might be too simplistic to infer from the

pure amount of time spent on media to non-media activities. We suppose that non-media leisure activities such as physical, social, creative, or intellectual activities may improve physical and psychological health in children as well as help them to improve their social or cognitive skills (e.g., Coatsworth et al., 2005; Shikako-Thomas et al., 2012). Depending on the media repertoire of specific types of media users, we assume that both the displacement and the more-the-more-hypotheses may be applied: Only specific media repertoires may replace non-media activities, not media use in general. Thus, it does not seem very fruitful to focus on just one medium or content, or general media use duration to discuss the optimal amount of media usage time for children; one also needs to have an eye on the variety of frequently used media. The research questions are analyzed with data collected in the MIKE<sup>2</sup> 2017 study (Genner et al., 2017), a representative survey study of Swiss primary school children.

## 2 Methods

In the following section, we provide information on data collection, our sample of reference, and the measures used to answer our research questions.

### 2.1 Data collection

This study uses data collected in 2017 in the French-speaking part of Switzerland as part of the MIKE-2017 study (Genner et al., 2017). MIKE-2017 is a representative study on the media usage of Swiss primary school children, covering all languages of Switzerland. The MIKE-2017 project was led by the ZHAW Zurich University of Applied Sciences. Older children (fourth through sixth grades) were asked about their media use via a written standardized

questionnaire that they could complete themselves, whereas younger children (first through third grades) were interviewed orally.

For three theoretical and methodological reasons, we queried primary school children: First, we assumed that older children draw their media decisions more independently compared to younger children, who are mostly guided by their parents' choices. Second, we asked children about their media use instead of asking parents about their children's media use. By doing so, we assumed the data to be more valid regarding the real media use of children because there might be a difference between what children are supposed to do and what they actually do. Third, using questionnaires and interviews as a data-collection method does not allow for the inclusion of very young children in the sample who cannot answer these kinds of questions.

### 2.2 Sample

To obtain a representative sample, a multi-step sampling strategy was chosen (Genner et al., 2017). This sampling was started by a quota strategy comprising the region, urbanity, and school grade. Then, communities were chosen randomly; as good as possible, schools within these communities were randomly selected. Three data sets were collected this way: one for the German-speaking part of Switzerland, one for the Italian-speaking region, and one for the French-speaking part. We used the French-speaking data subset for our analyses with a representative sample of 448 French-speaking Swiss primary school children. The average age was  $M=9.8$  years ( $SD=1.8$ ). Additionally, each child provided a questionnaire to his or her parents; unfortunately, only 235 parents sent back their questionnaire. Therefore, we only analyzed parents' questionnaires on an exploratory basis because this sample is not representative. The average age of parents who returned the survey was  $M=41.8$  years ( $SD=5.5$ ).

2 MIKE is an acronym for *Medien, Interaktion, Kinder, Eltern* [Media, Interaction, Children, Parents]. The study was financially supported by the Jacobs Foundation and the National Platform for Youth and Media. The study was led by the ZHAW Zurich University of Applied Sciences.



### 2.3 Measures

We used several measures to address media use, children's non-media activities, as well as socio-economic characteristics.

#### 2.3.1 Media use

Children were asked how often they use different kinds of media. They could indicate their answers on 4-point Likert-type scales (1 = *never* to 4 = *every day / almost every day*). We added two newspaper-reading items (reading the quality press or reading commuters' press) to one mean-value index; also, the items on reading books and on reading comics were put together to a mean-value index. We tried to find possible dimensions between the media use items to reduce the list of items further, but based on a principal axis analysis, we decided against further reduction. Principal axis analysis (Varimax rotation) revealed four axes (*Eigenvalue* > 1; *KMO* = .690; Bartlett's test of sphericity: *Chi-square* = 778.017 (78); *p* < .001), but since these axes explained only 33.6% of the variance, we did not bundle more variables than the above mentioned. Instead, we proceeded with 13 media use variables: gaming (*M* = 2.9; *SD* = 1.0), watching TV (*M* = 3.3; *SD* = 0.8), taking pictures / videos (*M* = 2.3; *SD* = 0.9), using a smartphone (*M* = 2.7; *SD* = 1.1), using a tablet (*M* = 2.5; *SD* = 1.0), Internet use (*M* = 2.7; *SD* = 1.1), listening to audio plays (*M* = 1.4; *SD* = 0.7), listening to music (*M* = 3.2; *SD* = 0.9), listening to the radio (*M* = 2.1; *SD* = 1.1), watching DVDs / Blu-rays (*M* = 2.3; *SD* = 0.8), going to the cinema (*M* = 2.0; *SD* = 0.4), reading books / comics (*M* = 2.7; *SD* = 0.9), and reading newspapers (*M* = 1.4; *SD* = 0.7).

#### 2.3.2 Non-media activities

We chose diverse non-media activities children can engage in when they have leisure time. These media activities can be theoretically categorized into four categories concerning their main impact (accounting for the fact that most leisure activities serve diverse functions, of course). For each activity, children were asked how often they engage in these non-media leisure activities on 4-point Likert-type scales (1 = *never*

to 4 = *every day / almost every day*). Overall, the variables are normally distributed, even though K-S tests indicate non-normal distributions. Since ANOVA and Kruskal-Wallis tests are quite robust against (moderate) violations of their premises, we used all variables for further analyses. In the questionnaire, items were not sorted as presented here, and categorization may only help interpret the findings:

- 1) As (mainly) intellectual activities, we define doing homework for school (*M* = 3.6; *SD* = 0.7) or going to the library (*M* = 1.7; *SD* = 0.7).
- 2) As creative activities, we define drawing, painting, or crafting (*M* = 2.6; *SD* = 0.9), or playing music (*M* = 2.1; *SD* = 1.1). Of course, we do not assume that these activities are completely free of physical, intellectual, or social events, but we see creativity as the most important aspect of these activities.
- 3) Physical activities may involve physical, creative, or intellectual activities, but they also often involve some kind of sportive or playful action, especially when it comes to playing outside or doing sports. Since playing outside probably involves more physical activity than playing inside, we analyze both separately. Children were asked how often they play outside (*M* = 3.5; *SD* = 0.7), inside (*M* = 3.5; *SD* = 0.8), and how often they do play sports (*M* = 2.9; *SD* = 0.8).
- 4) Social leisure activities involve interactions with peers or pets that are taken care of to learn responsibilities. We especially asked for how often children engage in family activities (*M* = 2.8; *SD* = 0.8), activities with friends (*M* = 3.2; *SD* = 0.8), and caregiving activities for pets (*M* = 2.4; *SD* = 1.3). These activities do not necessarily involve physical activities or creative or intellectual activities, even though they might.

#### 2.3.3 Children's and parents' age

Children and parents were asked for their age. Children's age was *M* = 9.8 (*SD* = 1.8); parents' age was *M* = 41.8 (*SD* = 5.5) in our sample. Please note that not all parents re-

turned a questionnaire; therefore, the parents' results have to be interpreted with caution.

### 2.3.4 Socioeconomic background

We used different indicators to identify the families' socioeconomic background. These indicators are based on the Family Affluence Scale (FASII) (Currie, Molcho, Boyce, Holstein, Torsheim, & Richter, 2008; Schnohr, Kreiner, Due, Currie, Boyce & Diderichsen, 2008). The items were added to a mean index ( $M=2.0$ ;  $SD=0.6$ ), reaching from 1 (*low SES*) to 3 (*high SES*), which has been statistically adjusted for age effects.

## 3 Results

In the following section, we describe our strategy of data analysis before we turn to answering our research questions.

### 3.1 Building media user types

To find distinct media use repertoires (RQ1) that make up the user types, we used K-means cluster analysis with Euclidean distance (MacQueen, 1967). Cluster analysis is data driven and is therefore an explorative procedure to find groups of similar response patterns within a given sample; here, we built clusters based on

the media use responses. K-means procedure for cluster analysis allows building groups of media users, which are quite homogenous within each group and rather different compared to the other groups. We decided to compare three media use clusters; the optimal number of clusters was determined by the "Nb-Clust" R-package (Charrad, Ghazzali, Boiteau, & Niknafs, 2022). Furthermore, we compared  $F$  values of different cluster solutions and were guided by the interpretability of the cluster solutions. Discriminant analysis shows that 96.1% of all cases can be correctly classified by a 3-cluster solution (*Wilks' Lambda* of function 1 = 0.128;  $\chi^2 = 834.203$ ;  $df = 26$ ;  $p < .001$ ; *Wilks' Lambda* of function 2 = 0.510;  $\chi^2 = 273.775$ ;  $df = 12$ ;  $p < .001$ ). The most discriminant items (standardized canonical coefficients  $> 0.3$ ) of function 1 are Internet use, smartphone use, and gaming. The most discriminant items of function 2 are listening to the radio, reading newspapers, and taking pictures / videos.

### 3.2 Cluster description

RQ1 asked which types of media users can be identified in a representative sample of primary school children. To illustrate those types, Table 1 shows the mean values of the media use items for each cluster.

Table 1: Cluster description by media use variables

Media use activity	Visual drifters (Cluster 1) n = 135		Modern diversifiers (Cluster 2) n = 81		Traditional offliners (Cluster 3) n = 199	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Games	3.4	0.8	3.3	0.8	2.3	0.9
TV	3.3	0.8	3.6	0.6	3.2	0.8
Photos / Videos	2.3	0.9	3.1	0.8	2.1	0.8
Smartphones	3.4	0.9	3.5	0.8	1.9	0.9
Tablets	2.6	1.1	2.9	1.1	2.3	0.9
Internet	3.7	0.5	3.5	0.7	1.8	0.8
Audio Plays	1.2	0.5	1.5	0.8	1.6	0.8
Music	3.3	0.8	3.7	0.6	2.8	0.9
Radio	1.3	0.5	3.1	0.9	2.2	1.1
DVDs / Blu-Rays	2.0	0.8	2.6	0.9	2.3	0.7
Cinema	2.0	0.4	2.1	0.4	2.0	0.4
Books / Comics	2.2	0.8	3.1	0.7	2.9	0.8
Newspapers	1.2	0.3	2.0	0.8	1.4	0.6

Note: Media use was measured on a Likert-type scale from 1 = never to 4 = almost every day / every day.

Cluster 1 ( $n=135$ ) could be named *visual drifters*. Children in this group have a clear preference for screen media because they mainly use games, television, smartphone, and the Internet and quite often listen to music. However, they seem to be rather “passive” than “active” users. They rarely read newspapers or listen to audio plays and the radio. Children in cluster 2 ( $n=81$ ) – the *modern diversifiers* – often listen to music, watch television, or use the smartphone and the Internet. However, they also use a great variety of all kinds of different media quite often, except for audio plays. This cluster is therefore characterized by broad and extensive media use in general. Children in cluster 3 ( $n=199$ ) mostly watch television, but they also read books and comics and listen to music (even though they do not use these media as much as they use the TV). They scarcely use the Internet. Since children in cluster 3 seem to have quite a limited set of media they use and rarely use the Internet at this young age, we name this cluster *traditional offliners*. It must, however, be noted that they may not stay offliners while becoming older. Nevertheless, at this age they obviously use “traditional media” and they might be simply late bloomers.

In general, cluster 2 shows the highest mean values for all media compared to the other clusters; thus, children in this cluster generally use more media more often. In contrast, children in cluster 3 show lower mean values for the use of different media, indicating that they use media much less than the others. Cluster 1 mostly differs from cluster 2 concerning reading books and comics (children of cluster 1 read much less compared to cluster 2). Compared to cluster 3, children of the first cluster use the Internet much more. Remarkably, children in cluster 2 also differ mostly regarding Internet use from cluster 3 (children of cluster 2 use the Internet more often).

In line with the media repertoires approach (Hasebrink & Popp, 2006), one can describe and interpret the clusters against the background of socioeconomic variables such as the children’s age, the parents’ age, and the economic status of the households the children live in. Regarding

the parents’ age, there were no significant differences between the three clusters ( $F[2; 215]=1.556$ ;  $p=.213$ ); also, there were no significant differences for the household socio-economic status ( $F[2; 394]=1.389$ ;  $p=.251$ ). This result is remarkable because media repertoire research, for example, interrelates patterns of media use to social positions (Hasebrink & Popp, 2006; Hasebrink & Domeyer, 2012). In contrast, we find significant differences of children’s age between the clusters ( $F[2; 412]=50.621$ ;  $p<.001$ ;  $p_{\text{Levene-Test}}=.296$ ): *Traditional offliners* are about two years younger than the *modern diversifiers* and the *visual drifters*. Differences between the ages of the latter two are not significant.

### 3.3 Non-media activities of media user types

RQ2 asked for non-media activities such as engaging in family activities, meeting with friends, or doing sports. Children were asked how often they do those different non-media activities in their spare time; they could answer on Likert-type scales from 1 = *never* to 4 = *almost every day/every day*. Tables 2 to 5 show the mean differences between media user types regarding those non-media activities. Overall, except for playing sports, *visual drifters* show the lowest mean values, which leaves the impression that they are less interested in non-media activities (except for sports) compared to the other groups. In turn, *visual drifters* seem to be more open to non-media activities; they especially play inside or outside in their leisure time. In general, *modern diversifiers* show a mixed set of non-media activities as well. Especially concerning social non-media activities, they differ significantly from the rest.

For readability reasons, more detailed analyses of the clusters’ non-media activities are guided by the four theoretical categories of non-media activities mentioned above.

#### 3.3.1 Intellectual non-media activities

Differences between the clusters were analyzed by conducting ANOVAs after testing for normal distribution and homogeneity of variance. Regarding intellectual



Table 2: Intellectual non-media activities for media user types

Cluster	<i>N</i>	<i>M</i>	<i>SD</i>	95% LLCI	95% ULCI
Homework ( $F=0.711$ ; $df=2$ ; $p=.492$ )					
Visual drifters	135	3.5	0.7	3.38	3.63
Modern diversifiers	80	3.6	0.6	3.47	3.75
Traditional offliners	199	3.6	0.6	3.47	3.64
Total	414	3.6	0.7	3.49	3.61
Library ( $F=0.948$ ; $df=2$ ; $p=.388$ )					
Visual drifters	135	1.6	0.7	1.50	1.73
Modern diversifiers	81	1.7	0.7	1.53	1.85
Traditional offliners	198	1.7	0.7	1.62	1.82
Total	414	1.7	0.7	1.61	1.75

Note: Levene-Tests n. s. (indicating homogeneity of variance). Non-media activities were measured on 4-point Likert-type scales from 1 = never to 4 = almost every day / every day. Mean values indexed by different letters differ significantly from one another (along Bonferroni Post-Hoc-Tests).

Table 3: Creative non-media activities for media user types

Cluster	<i>N</i>	<i>M</i>	<i>SD</i>	95% LLCI	95% ULCI
Drawing / Painting / Crafting ( $F=5.077$ ; $df=2$ ; $p=.007$ )					
Visual drifters	132	2.4 <sup>a</sup>	0.9	2.27	2.59
Modern diversifiers	81	2.7 <sup>ab</sup>	0.9	2.49	2.87
Traditional offliners	199	2.8 <sup>b</sup>	0.9	2.62	2.87
Total	412	2.6	0.9	2.55	2.72
Music ( $F=5.820$ ; $df=2$ ; $p=.003$ )					
Visual drifters	134	1.9 <sup>a</sup>	1.1	1.67	2.04
Modern diversifiers	81	2.4 <sup>b</sup>	1.2	2.11	2.63
Traditional offliners	197	2.2 <sup>b</sup>	1.1	2.01	2.32
Total	412	2.1	1.1	1.99	2.21

Note: Levene-Tests n. s. (indicating homogeneity of variance). Non-media activities were measured on 4-point Likert-type scales from 1 = never to 4 = almost every day / every day. Mean values indexed by different letters differ significantly from one another (along Bonferroni Post-Hoc-Tests).

non-media activities, we do not find significant differences between the three media user types (Table 2). All children seem to devote a similar amount of time to their homework ( $M_{\text{all clusters}} > 3.5$ ), and all children visit the library rarely ( $M_{\text{all clusters}} < 1.7$ ).

### 3.3.2 Creative non-media activities

Making music seems to be not very common among French-speaking Swiss primary school children in general (i. e., mean values for the clusters are quite low). Only *modern diversifiers* show at least some interest in making music ( $M=2.4$ ;  $SD=1.2$ ) compared to the other two groups. Overall, *visual drifters* are less interested in creative activities like playing music or crafting / painting / drawing (Table 3). While crafting, drawing, or painting is not prac-

ticed very often by screen media users ( $M=2.4$ ;  $SD=0.9$ ), *traditional offliners* are more interested in these activities compared to the rest ( $M=2.8$ ;  $SD=0.9$ ).

### 3.3.3 Physical non-media activities

*Visual drifters* differ significantly from the other groups regarding playing inside as well as playing outside, indicating that they are less physically active in their leisure time (Table 4). Since the Kruskal-Wallis test indicates that differences between the three clusters are not significant for sports, we exclude these results from the interpretation. However, in tendencies, *modern diversifiers* seem to be most physically active here.

**Table 4: Physical non-media activities for media user types**

Media user types (Clusters)	N	Mean ranks	
Sports (without sports in school)			$(\chi^2 = 5.498; df = 2; p = .064; n = 412)$
Visual drifters	133	204.3	
Modern diversifiers	80	230.4	
Traditional offliners	199	198.4	
Play outside			$(\chi^2 = 12.388; df = 2; p = .002; n = 415)$
Visual drifters	135	181.7 <sup>a</sup>	
Modern diversifiers	81	216.4 <sup>b</sup>	
Traditional offliners	199	222.4 <sup>b</sup>	
Play inside			$(\chi^2 = 7.649; df = 2; p = .022; n = 411)$
Visual drifters	134	187.9 <sup>a</sup>	
Modern diversifiers	80	203.3 <sup>ab</sup>	
Traditional offliners	197	219.4 <sup>b</sup>	

Note: Levene-Tests significant (indicating inhomogeneity of variance). Non-media activities were measured on 4-point Likert-type scales from 1 = never to 4 = almost every day / every day. Mean values indexed by different letters differ significantly from one another (along Bonferroni Post-Hoc-Tests). Children were also asked if they were attending youth group activities; here, we did not find significant differences between the groups.

**Table 5: Social non-media activities for media user types**

Media user types (Clusters)	N	M; [Mean ranks]	SD	95% LLCI	95% ULCI
Family ( $F = 6.157; df = 2; p = .002$ )					
Visual drifters	134	2.6 <sup>a</sup>	0.8	2.51	2.77
Modern diversifiers	81	3.0 <sup>b</sup>	0.8	2.82	3.16
Traditional offliners	199	2.9 <sup>b</sup>	0.8	2.77	2.98
Total	414	2.8	0.8	2.75	2.90
Friends ( $F = 12.21; df = 2; p < .001$ )					
Visual drifters	134	3.3 <sup>b</sup>	0.8	3.13	3.40
Modern diversifiers	81	3.5 <sup>b</sup>	0.6	3.35	3.63
Traditional offliners	196	3.0 <sup>a</sup>	0.8	2.90	3.12
Total	411	3.2	0.8	3.11	3.26
Pets ( $Chi-square = 8.943; df = 2; p = .011$ )					
Visual drifters	133	[190.6 <sup>a</sup> ]			
Modern diversifiers	81	[236.7 <sup>a</sup> ]			
Traditional offliners	196	[202.8 <sup>a</sup> ]			
Total	410				

Note: Levene-Tests n. s. (indicating homogeneity of variance) for family and friends; significant Levene-Test results for pets. Kruskal-Wallis Test for the item taking care of pets: mean ranks in "[ ]". Non-media activities were measured on 4-point Likert-type scales from 1 = never to 4 = almost every day / every day. Mean values indexed by different letters differ significantly from one another (along Bonferroni Post-Hoc-Tests).

**3.3.4 Social non-media activities**

Results show that *modern diversifiers* engage more often in social non-media activities compared to the others (Table 5): They meet significantly more often with friends ( $M = 3.5; SD = 0.6$ ), participate significantly more often in family activities ( $M = 3.0; SD = 0.8$ ). In turn, except for meeting with friends,

*visual drifters* show significantly lower values in engaging in family activities ( $M = 2.6; SD = 0.8$ ) and taking care of pets ( $M = 2.2; SD = 1.3$ ).

#### 4 Discussion and conclusion

Media are omnipresent in children's life (Genner & Süß, 2017; Kabali et al., 2015; Livingstone, 2014), so most children experience a mediated childhood to some degree. Previous research has shown that some media use can harm child development such as promote obesity or aggressiveness, negatively impact mental health (e.g., Strasburger et al., 2012). Nevertheless, children cannot and should not be isolated from the media in the long run because they have to acquire media literacy. Therefore, one needs to take a closer look into children's media use behavior to identify which groups are particularly vulnerable when it comes to adverse effects on non-media everyday life.

In this paper, we examined how the variety of used media affects non-media activities in children's leisure time. Instead of focusing on one particular medium, we adopted a media repertoire view (e.g., Hasebrink & Hepp, 2017; Hasebrink & Popp, 2006; van Kruijstum et al., 2014) describing children's behavior. First, we identified children who differ with regard to their media patterns by cluster analysis in a sample of 448 French-speaking Swiss primary school children (Genner et al., 2017). Our data revealed three distinctive clusters: Children in cluster 1 (*visual drifters*) show a strong focus on screen media, those in cluster 2 (*modern diversifiers*) were versatile media users, and children in cluster 3 (*traditional offliners*) were more selective media users with a rather narrow media repertoire. Although we could not observe statistically significant differences in the socioeconomic status among the parents, cluster 3 significantly differed with respect to the children's age from the others. We then analyzed how the groups differed concerning their non-media activities. We showed that focusing only on the frequent use of some particular media falls short.

In contrast, the variety of different media mattered, too. Children who used a more extensive range of various media have more diverse leisure activities consisting of a mixture of different non-media activities. This supports the "the more, the

more hypothesis" (e.g., Meyersohn, 1968; Mutz et al., 1993), which posits that more media activities do not necessarily lead to less non-media activities. The group of children with a strong focus on screen media may be the ones considered vulnerable to negative effects as indicated by Browne et al. (2020). For them, the concurring "displacement hypothesis" (e.g., Meyersohn, 1968; Mutz et al., 1993) seems to fit better, thus media consumption probably displaces their non-media activities to some degree.

Therefore, our results contribute to a very important research field: First, simply looking at the total number of media used by a child does not indicate if a child is more or less engaged in non-media activities. Second, these findings support the call for education in media competences – since children deal with a multitude of different media, they need to learn how to benefit most from each medium. Just as a healthy food plan contains different nutrients that are carefully combined, a healthy media repertoire contains different media that can be profitably used.

As mentioned above, cluster analysis is an exploratory, data-driven method for data analysis. To substantiate our findings, we need to replicate our analyses with a different sample. Furthermore, we focused on a French-speaking sub-sample. To gain a more unobstructed view on the impact of culture on children's media behavior (and non-media activities), comparative analyses seem promising (e.g., using a most similar approach and / or a most different approach). Besides non-media activities, other dependent variables appear to be interesting (such as aggressiveness, cognitive abilities, obesity) to connect to this large body of research. Last, we need more long-term analyses to address causality questions because we cannot find out if media consumption leads to more or less active leisure time or if third variables influence media and non-media behavior. In this sense, a large variety of frequently used media and a good mixture of different non-media activities on the one hand and a poor media diet connected to a narrow set of non-media activities on the other hand might be just an indicator

of more or less deprived children. This, in turn, takes us back to Meyersohn (1968) who connected media consumption and non-media activities to socioeconomic or intellectual deprivations (Meyersohn, 1968, p. 103), which he especially assumed for higher class individuals; thus, he linked media and leisure behavior to social class. Based on this assumption, one could broaden the perspective to different socio-cultural variables apart from class, such as the social situation in general or social or cultural background.

Taken together, investigating patterns of children's media use seems to be a promising research field. Future research needs to take a more in-depth look into describing these media use types (e. g., their motives, their health) and embedding them into their socio-cultural contexts.

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## Conflict of interests

The authors declare no conflict of interests.

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