

# A Reflection towards Understanding the Effect of Methodology Use on the Young Children's Developmental Research

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## Introduction

Since the first time of the seminal research on children's development by Vygotsky and Piaget, especially regarding self-regulation, speech use, and thinking aloud at an early age, the research, so far, still follows the same methodological steps to complete the experiment where the experimenter still interferes before, during, and after the progression [1,2]. Ironically enough, although the research and up to date are still continuing to support their participants with explicit instructions before/during/after the progression to regulate themselves and prompt them to talk/act when they are silent for long periods, those practices are already not recommended from long time ago [3-8]. Methodologically, those practices place artificial constraints on the situation, changes the cognitive processes and task activities required, and distort the natural spontaneous emergence of self-regulatory behaviour. Thus, a new revolution concerning children's development remains as a dream as there is no singe to achieve that dream yet!

**Keywords:** Children's development; Methodological critiques; Reflection and understanding

## Seeking Help vs. Participant Natural Development

Many studies clarified the main complexities of self-regulation in the school contexts as the effects of which had to be determined to know how self-regulation occurred [9-11]. Therefore, schools with children are complex places and much different from controlled laboratory settings with adults. A clear example of this complexity is seen in research on help seeking to understand the material, which is an essential and important strategy of self-regulation where all students require assistance at times [12]. Thus, the previous research, so far, always interferes before the progression (how can the participant use the material?), during the progression (what they should do to continue?), and after the progression (how to evaluate their satisfaction?). In terms of cognitive load, however, all those methodological aspects are clearly hindering the participant development [13].

## Towards Task Focus Process vs. External Focus Process

Remarkably, the most related affordable studies still involve the external regulators to instruct and guide the participants either before, during, or after the experiment in which all of them still followed either Vygotsky's views or Piaget's views [1,4,5]. On one hand, such an external intervention, which is an actual form of social interaction, may negatively affect children to verbalise their actual and natural regulation behaviour and, therefore, may direct their cognitive process towards undesirable verbalisation. Precisely, this external regulation may cause children to divide their cognitive capacity between the present task and understating the external instructions, thereby forcing their cognitive process to work in different directions (i.e., towards a task focus process vs. an external focus process). Methodologically, this is what so-called extraneous cognitive load of learners that should be minimised during the learning process [14]. On the other hand, the children's silence during task performance is also a cause for concern, especially for long time where the verbalisation becomes invaluable and could lead to undesirable verbalisation either [15].

## The Spontaneous Thinking Aloud vs. Obligatory Thinking Aloud

Many researches have criticized the Thinking Aloud (TA) technique for the fact that TA and the limited capacity of memory hinder the participant's cognitive processes [16,17]. Thus, affecting performance if the tasks involve a high cognitive load especially that the presence of the external regulator, to a great extent, creates the problem of separating the verbalization of both private speech and TA from the undesirable speech. When the external regulator, on one hand, interferes insufficiently to guide the participants, their verbal/nonverbal cues during the performance might result in an inappropriate level of verbalization in which their verbalization is, mostly, a feedback to the environment rather than to those instructions. On the other hand, when the external regulator interferes sufficiently, the participants who were asked to think aloud, as

part of a research method, will not talk to themselves spontaneously but, instead, because they have been instructed to do so. In terms of spontaneous interaction, this will not be considered as a natural verbalization as the participant had been forced to loudly talking and/or thinking especially during the progression! [18].

## The Pre-selected Samples vs. the Outcomes' Reliability

From an experimental point of view, one of the most common and inevitable experimental steps in the previous work of children's development is that, the researchers usually specified and divided the samples in advance. This is usually done either by primary diagnosis before the experiment in the form of condition-A vs. condition-B or randomly distribution between the two conditions. The two conditions, then, may or may not associate with such a hypothesis that already proposed in advance too to test such a factor. This is usually done without realizing the fact that the individual and intellectual characteristics are changeable during learning tasks in which the child's mental status may or may not be intellectually changing from one task to another during the progression. Thus, the reliability of the outcomes is in critical and suspicious level despite the use of different and various statistical tests.

## Computer as an External Regulator vs. Computer as an Aid

From a computer programming point of view, still there is a great gap needs to be filling up given the fact that the use of the computer, per se, at an early developmental investigations, especially for the symptomatology of developmental problems, in terms of detection, classifications, identification, and diagnosis has not potentially emerged in the literature yet. This is despite the large and huge body of the research that usually and regularly used the computer as an aid (typically in the form of games and/or educational/learning tools to investigate various and different aspects, concepts, or ideas). Thus, the most appropriate question is not whether a machine can do psychotherapy or even whether it can do psychotherapy as perfect as a human does and, therefore, it is certainly not whether a computer should do therapy [19]. Instead, what precisely we need to know is whether a machine, as a nonhuman external regulator, can do anything useful/valuable for children who need help with the sorts of developmental problems that bring them to the specialists and counsellors at an early age for whatever the machine process may be called. In other words, how can the computer, as a nonhuman external regulator, be able to enable the young children to be diagnostic especially during learning tasks?

## Self-reported Participant vs. Self-diagnostic

Over the past several decades, researchers found a significant link between problem solving and various measurements of

psychological adjustment [20-25]. However, the major issue for mental health professionals is how to identify children's developmental problems at an early age because children, by themselves, cannot offer self-reports nor can be self-diagnostics to report their mental status and, therefore, their external regulators' views are mostly subjective. Therefore, most young children are not evaluated by a psychologist or psychiatrist until their problems come to the attention of someone of the external regulators (the teacher, caregiver, parents). Noteworthy, when the symptoms of the developmental problem reach the level of a diagnosable disorder in school-age children, they are relatively resistant to treatment [26-27]. Thus, the need of new methodologies are actually needed that can help the young children to spontaneously diagnosis themselves by themselves! Accordingly, how can the young participants with development problems be able to be self-diagnostic at an early age?

## Mainstream Users vs. Users with Developmental Problems

From a technical point of view, when using computer in the studies concerning developmental problems, the young children, generally people, with developmental problems are usually facing difficulties and complexities to use the standard input devices such as mouse, keyboard, trackball, and joystick [28-31]. In specific, common pointing problems for children with developmental problems include inability to aim at small targets, difficulty moving the pointing device, and difficulty controlling the pointer's buttons such as the inability to press the buttons or moving the cursor from the target after clicking. One of the main reasons to explain the computer's inaccessibility to these individuals is that most computer standard input devices are designed for the mainstream population without taking into account the fact that the input devices might also be used by people with developmental problems who generally face computer operation problems [28-31]. Thus, such people have limited access to the growing number of well-designed programs available to computer users, unless their computers have specialized alternative input devices [32,33]. On the same context, the stimulus materials that used with the mainstream participants may not adequate for those with developmental problems.

## Conclusion

Simply put, the literature, up to data, still involves a massive body of various and different critiques including the methodological one. All those critiques explain why the research, so far, regarding children's development appears like "turn" and "around" on itself as nothing unique was added to the literature yet. This is the main reason why the subsequent and current research did and do not come up with new outcomes that may, or at least, leads to a revolution especially when the young children are conducted to be the end users. Simply put, what precisely and firstly we need nowadays is to overcome those critiques and, secondly, to seriously think about new methodology/methodologies for more accurate and

reliable outcomes given the affordable advanced technologies nowadays.

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