

Analysis of Cognitive-Affective Tensions in Bodily Guidance in Physical Education in Senegal: Between Recognized Utility and Lived Discomfort

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Abstract

This study, conducted in Senegal, explores how secondary school pupils in Dakar subjectively experience physical guidance in PE, that is, the physical gestures through which the teacher corrects or directs the pupil's movement. Using a mixed-methods design combining questionnaires completed by 153 pupils and interviews with 8 teachers, the research highlights a cognitive-affective paradox reflected in the fact that 31% of pupils recognize the educational value of guidance whilst expressing discomfort at receiving it. This paradox is strongly influenced by gender and year group. Girls in Year 11 experience the highest level of tension, due to the combined effect of cultural norms of modesty, peer scrutiny and the developmental vulnerability associated with adolescence. Conversely, boys in their final year of secondary school demonstrate almost complete ease. The study identifies four typological profiles of pupils, each requiring a differentiated pedagogical strategy, and highlights the moderating role of extracurricular physical activity as a form of bodily capital that facilitates the reception of guidance. These results call for a rethinking of PE teacher training within specific socio-cultural contexts.

Keywords

Cognitive-Affective Paradox, Bodily Guidance, Weighted Discomfort Index, Physical Education

1. Introduction

Every pedagogical practice engages learners in representations, affects and meanings that go beyond the mere transmission of knowledge [1]. In physical education

(PE), these representations are particularly salient, insofar as the body itself—both the student's and the teacher's—simultaneously constitutes the medium, the object and the tool of the teaching-learning process [2] [3]. It is through this process that bodily guidance is actualized as a form of “professional touch” [4]. Defined as the set of professional gestures [5] by which the teacher acts physically on the student's body to support, correct or orient their motor action, bodily guidance appears as one of the most frequent modes of intervention by PE teachers. It partly reflects the singularity of this discipline, while crystallizing all the tensions inherent to the embodied educational act.

However, bodily guidance in the school context remains a particularly complex practice. It is not merely a technical act whose effectiveness needs to be optimized. It encompasses ethical, communicational, relational and psychological dimensions that are important to understand, particularly from the perspective of those who experience it—namely the students. These dimensions remain insufficiently explored in existing research, even though some works have attempted to grasp their significance [6]-[8]. Furthermore, most of this research has been conducted in Western settings that do not necessarily share the same social and cultural realities as other contexts. In settings such as Senegal, where physical contact is culturally codified and socially regulated, the teacher's guidance actions on students are neither perceived nor experienced as neutral. They are subject to diverse interpretations within the imaginary of individual and collective representations. This observation is also applicable in other social contexts comparable to Senegal, particularly in Maghreb countries, where authors [9] [10] have shown that the body in PE is never neutral, but is traversed by norms of gender, modesty and religion, creating an environment in which any intervention on the student's body is necessarily charged with social and cultural meanings.

It is in this perspective that the present study attempts to explore the cultural, social and psychological dimensions of bodily guidance, focusing on students' subjectivity through their affects and potential reluctance toward this practice. Specifically, it seeks to explore how students in PE classes subjectively experience the bodily guidance they receive from their teacher, with regard to their representations and their cultural and social histories. In doing so, we posit that students do not experience their PE teacher's guidance as a simple neutral pedagogical act, but interpret it through the prism of their cultural and social representations of bodily contact. Therefore, depending on gender and internalized cultural norms, bodily guidance generates contrasting affective experiences, ranging from acceptance to various forms of reluctance, thus revealing the tensions between the didactic requirements of PE teaching and the sociocultural realities of the Senegalese context.

The article is organized into five sections. The first is devoted to literature review. The second presents the theoretical framework underpinning our approach. The third presents the methodology and analytical apparatus mobilized, while the fourth sets out the analysis, interpretation and discussion of results. The final sec-

tion, devoted to the conclusion, closes the article and draws implications for teacher training while opening research perspectives.

2. Literature Review

Scientific literature on teachers' bodily guidance practices shows that work in this field has long been dominated by an essentially technicist logic, seeking to determine whether this practice is effective or not for learning motor skills in classroom settings. In this regard, it should be noted that results indicate an overall positive trend [11]-[13]. However, beyond the demonstrated advantages of this practice in supporting and accompanying motor learning, several authors [14]-[16] are now interested in its psychological, moral and ethical effects, which have until recently been poorly documented in the field of physical education. For these authors, the concern is to determine, beyond its instrumental dimension, under what conditions bodily guidance and the touching actions it involves are pedagogically relevant and ethically legitimate—even if, according to [17], the teacher holds justified access to the student's body within the framework of their teaching.

In this perspective, the work of [16], approaching the question of bodily touch through the lens of the didactic contract [18], shows that students identify several situations in which guidance is perceived as inappropriate and likely to break this contract. This is notably the case when the student wishes to feel autonomous and capable, such that any teacher intervention is experienced as an intrusion that undermines self-confidence. Moreover, when the activity being practiced does not require the acquisition of specific techniques, recourse to guidance appears unjustified and therefore poorly received. In this regard, [19] argues that self-controlled guidance—where the learner decides when to seek physical assistance—produces better learning outcomes than guidance imposed by the teacher. In other words, guidance that preserves the learner's bodily autonomy is simultaneously more effective motorically and more respectful of their subjectivity. Similarly, the ethical analyses of [6] and the reflections of [7] consider almost unanimously that pedagogical touch is only legitimate if it respects the student's bodily subjectivity and does not substitute itself for their own motor engagement. Across these authors, the appropriateness or otherwise of guidance does not depend solely on the situation or activity, but primarily on the person who receives it. In other words, what is acceptable for one student may be experienced as uncomfortable by another. From this perspective, communication between teacher and student appears to be an essential condition for guidance to be consented to and well received.

In the same vein, [11] concluded in their research that a minority of students wish to receive neither smiles nor physical contacts. Moreover, the majority prefer smiles to contacts, considering that the teacher's role is not to touch them as this constitutes an overly personal action. Nevertheless, they feel less discomfort when it concerns corrective action. Furthermore, these authors note the existence of differences related to class level (hence age), as well as to students' gender. Indeed, the gendered dimension of bodily guidance has been documented by several au-

thors [6] [20] [21]. It should be emphasized that gender norms not only structure the frequency of bodily contacts, but also their subjective interpretation—that is, the same gesture of guidance may be perceived as technical support by boys and as an intrusion into intimate space by girls.

This interpretive asymmetry is amplified, in Francophone African contexts, by specific cultural constructions of modesty that confer upon the female body a particularly salient status as an object of collective gaze in physical exercise spaces. In this regard, in their work conducted in an Arab-Muslim context marked by strong cultural codification of the body, [10] shows that the teacher's gender significantly modulates recourse to corrective touch: male teachers report avoiding touching female students out of respect for cultural norms, while female teachers resort more frequently to touch with students of both sexes, adopting a more affective and reassuring posture. In the same sociocultural configuration, [9] notes the discomfort of male teachers when it comes to physically assisting female students in gymnastics, preferring to have a girl take charge—suggesting that physical contact between a (male) teacher and a female student is socially constructed as problematic in this context.

In the same vein, the studies of [15] emphasize that the acceptability of bodily guidance rests above all on the legitimacy of its pedagogical purpose and the quality of the teacher-student relationship. They also indicate that guidance between teachers and students of the opposite sex generates specific tensions depending on students' cultural profiles. [15] has shown, for example, that Swedish female students, influenced by markers of heteronormativity, develop a principled mistrust toward their teachers while paradoxically showing them sympathy, whereas girls from immigrant backgrounds struggle to identify the pedagogical purpose of guidance due to the cultural or religious norms of their countries of origin. In both cases, the teacher's professionalism, though recognized as a legitimizing factor, is insufficient to dispel the sense of insecurity felt.

In sum, bodily guidance must pursue a clearly identifiable pedagogical purpose, be embedded in a relationship of trust between teacher and student, and take into account the singularity of each student—notably their relationship to the body, to autonomy and to their cultural context. These conditions are not always met, however, and their appreciation remains eminently subjective and contextual. This observation invites moving beyond general and normative approaches to interrogate more precisely how these conditions unfold in specific contexts, where the cultural, social and relational variables specific to students can considerably modify the experience, acceptability and perception of bodily guidance.

3. Theoretical Framework: The Body between Cognition and Affect

3.1. The Body in Debate

For a long time, the body was perceived as a simple biomechanical instrument, a tool for performance. It was nothing more than a fleshy envelope independent of

the other dimensions (namely the soul and/or spirit) that are nonetheless constitutive of the human being [22]. This body/mind dualism, according to [23], “was constructed in the West by separating flesh and sex on one side... and soul and consciousness on the other” (p. 24). This maintained disconnection between these different dimensions of the human has led to the idea that the biological body—arising from its distinction from the mind—has only a mechanical function, an objectification of the body that has led to a valorization of the mind at the expense of the body.

However, the reflections of authors such as [24] and [25] began a different re-reading of the body. The body is perceived not only as an embodied and reflexive experience, but also as an entity inseparable from human subjectivity. In their line of argument, body and mind indivisibly form a whole. Beyond its purely biological dimension, [24] apprehends the body as the complex product of a socialization. For his part, Merleau-Ponty develops in the same perspective the idea of corporeal thought. The body ceases to be a simple object of medical prescription to become a “body-subject” [25], a locus of experience, responsibility and self-construction [26]. This unity restores to the body a constitutive value of the human being. It is now seen as the reflection of experiences felt and lived by the self [27], symbolizing at once the biological, the social, the psychological [23].

It is this conception of the body as a subjective, social and culturally constructed entity that grounds our approach to bodily guidance in PE. If the body is not a simple mechanical instrument but a “body-subject” bearing a history, a culture and a subjectivity, then touching a student’s body in the framework of a PE session cannot be reduced to a purely technical act. It necessarily engages the student’s subjectivity, their intimate relationship to the body, their cultural representations of touch, and the social norms governing bodily interactions in their environment. This perspective thus invites moving beyond the purely technical dimension of guidance to interrogate its relational, ethical and cultural dimensions.

3.2. Bodily Guidance: A Complex Educational Act

Bodily guidance cannot be reduced to a simple technical gesture. It constitutes a full-fledged educational act, situated at the intersection of cognitive, affective, relational and cultural dimensions. In the school context, it is not limited to tactile contact alone, but also encompasses forms of symbolic contact—such as gaze, gesture and spatial proximity—which actively participate in constructing the student’s bodily image. On the cognitive level, guidance exploits what the theory of embodied cognition [28]-[30] calls kinesthetic knowledge—a form of incorporated know-how, non-verbalizable, that can only be acquired through the direct experience of guided movement. On the affective level, it engages the relationship to one’s own body [25] in an interaction that may be experienced as reassuring or intrusive depending on context and subject [16]. Reference [31] has proposed a continuum model that situates guidance on an axis ranging from direct physical contact to deferred verbal instruction, each modality being more or less appropri-

ate depending on the student's level of expertise. This model, developed in a Western context, implicitly assumes a subject disposed toward bodily interaction—yet the context in which our study takes place appears different. Furthermore, self-determination theory [32] offers a complementary framework insofar as it allows understanding why some students perceive guidance as help and others as constraint, depending on the satisfaction or frustration of their basic psychological needs. Finally, the concept of the “body as object of the gaze”, developed from [26] and taken up by [33] in his theory of stigmatization, allows understanding how the feeling of being observed amplifies the discomfort felt during bodily corrections.

These theoretical frameworks constitute a relevant and coherent conceptual foundation for apprehending the complexity of bodily guidance in the school context. By articulating embodied cognition, phenomenology of the lived body, self-determination theory and the sociology of the gaze, we have a plural and integrated theoretical apparatus capable of grasping guidance in all its dimensions, without reducing it to a single disciplinary perspective. Far from excluding one another, these frameworks complement each other, each illuminating a specific facet of our object of study. It is on this plural and contextualized theoretical basis that we intend to produce a new understanding of bodily guidance, as it is experienced and felt by students in PE classes.

4. Methodology

Guidance is a complex object of study that cannot be grasped by a single methodological approach. To obtain a broad spectrum, a mixed design is adopted, combining quantitative and qualitative methods [34] [35]. The study was conducted in public high schools in Dakar and involved two populations: students and teachers.

4.1. Sampling and Sample

Firstly, a probabilistic sampling procedure based on simple random sampling without replacement [35] was used to select the four schools ($n = 4$) in which the investigation took place. Schools were located within the Dakar-Plateau educational district, an urban area characterized by a relatively homogeneous socio-economic profile among the student population. This context made it possible to partially control for institutional-context effects while preserving the representativeness of the broader urban environment of Dakar.

Secondly an intentional non-probabilistic sampling [35] was used to constitute a sample for the students. The inclusion criteria were as follows: 1) being enrolled in one of the four selected public high schools within the Dakar-Plateau district; 2) currently attending compulsory Physical Education (PE) classes at the time of the survey; 3) having completed at least one full PE instructional cycle during the current academic year. The final sample ($n = 153$) includes 73 Grade 11 students (47.7%) and 80 Grade 12 students (52.3%), with a mean age of 18.82 years. Gender distribution shows 76 girls (49.7%), 75 boys (49.0%), and 2 respondents (1.3%) who, for unknown reasons, did not indicate their gender.

Finally, a purposive non-probability sampling strategy was also used to select the eight ($n = 8$) participating teachers. To this end, given that our study was conducted in four high schools, we first interviewed one teacher in an initial institution. At the end of the interview, we asked this teacher to refer us to one of their colleagues working in the same school. Once the interviews had been completed in this first institution, the last teacher interviewed put us in contact with a colleague from a second high school. This process was progressively repeated until a total of eight teachers across the four high schools involved in the study had been reached. The selection criteria were: 1) teaching PE in one of the four selected public high schools within the Dakar-Plateau district; 2) having at least three years of secondary-level teaching experience; 3) using bodily guidance gestures in their declared teaching practice. This criterion of declared practice ensures that the qualitative data effectively relate to the object of study.

4.2. Data Collection Instruments

Data collection mobilized two instruments: a questionnaire for students and teacher semi-structured guide.

4.2.1. The Questionnaire

The questionnaire, composed of 16 multiple-choice items, was administered to students to gather data on their perceptions of bodily guidance and their relationship to the body in PE. This questionnaire validation was conducted in two complementary stages. Prior to data collection, a pre-test with a small group of students ($n = 15$) verified the clarity of item formulations and adjusted ambiguous items, in accordance with the recommendations of [35].

Following data collection, a comprehensive psychometric analysis was conducted on the full dataset ($n = 153$). **Table 1** presents the structure of the measurement instrument and identifies the dimensions retained for psychometric validation.

4.2.2. Summary of Psychometric Indices

Table 2 below presents the main psychometric properties of the instrument, including indicators of content validity, internal reliability, convergent validity,

Table 1. Instrument structure and dimensions retained for validation.

Sec.	Dimension (D)	Items (Q = Questions)	K	Scale
I	Sociodemographic data	Q1 - Q4: gender, age, grade level, extracurricular sport	4	Nominal
II	Body in PE-D1*	Q5 (body centrality), Q6 (learning through the body), Q7 (physical ability development)	3	Likert 5
III	Teacher practices-D2	Q8 (demonstration), Q9 (physical correction), Q11 (perceived usefulness)	3	Likert 5
IV	Bodily discomfort-D3*	Q10 (discomfort with touch), Q13 (feeling observed/evaluated)	2	Likert 5
IV-V	Body relationship/Open	Q12, Q14 (multiple choice), Q15 - Q16 (open-ended)	5	Nominal

*Dimensions retained for psychometric analyses. D1 and D3 are the primary dimensions of this exploratory instrument.

Table 2. Summary of reliability and validity indices.

Criterion	Indicator	Result	Conclusion
Content validity	Pre-test + theoretical grounding	Completed	Satisfactory
Reliability-D1	Cronbach's α	0.617	Satisfactory (>0.60)
Reliability-D1	Split-half Spearman-Brown	0.728	Satisfactory (>0.70)
Reliability-D2	Cronbach's α (3 items)	0.298	Theoretical multidimensionality
Reliability-D3	Cronbach's α (2 items)	0.441	Moderate-emerging indicator
Convergent validity	PCA variance-D1	57.5%	Common factor confirmed
Convergent validity	D2-D3 correlation	$r = 0.304^{***}$	Inter-dimension coherence
Discriminant validity	Gender t-test-Q10	$t = 4.908^{***}$	Large effect ($d = 0.800$)
Discriminant validity	Grade-level t-test (expected ns)	$t = 0.784$ ns	Gender not grade
Discriminant validity	Extracurricular practice t-test	$t = 3.741^{***}$	Medium-large effect ($d = 0.660$)

(***) indicates a statistically significant result, (ns) stands for "not significant" and indicates a non-significant result.

and discriminant validity. Taken together, these results provide an overall assessment of the coherence and scientific robustness of the measurement tool used in this study.

As shown in the above table, results indicate satisfactory reliability for the Body in PE dimension (D1): Cronbach's $\alpha = 0.617$, exceeding the exploratory threshold of 0.60 recommended by [36] for first-version instruments; Spearman-Brown split-half = 0.728, reaching the classical threshold of 0.70 (Nunnally & Bernstein, 1994). The first component of a principal component analysis accounts for 57.5% of D1 variance, attesting to a robust common factor. The discriminant validity of the instrument is established by a highly significant gender effect on the central discomfort-with-touch item (Q10): $t(149) = 4.91$, $p < 0.001$, Cohen's $d = 0.800$ (large effect), confirmed non-parametrically by the Mann-Whitney test ($U = 4050$, $p < 0.001$). Extracurricular practice constitutes a third discriminating variable: $t(148) = 3.74$, $p < 0.001$, $d = 0.660$. The positive correlation between the Teacher Practices (D2) and Bodily Discomfort (D3) dimensions ($r = 0.304$, $p < 0.001$) provides an inter-dimension convergent validity index. In other words, the more frequently physical interventions are perceived, the higher the reported discomfort level, consistent with the theoretical framework. The low internal consistency of D2 ($\alpha = 0.298$) reflects the inherently multidimensional nature of bodily guidance, in that demonstration, physical correction, and perceived usefulness constitute three pedagogical facets that the literature explicitly distinguishes [6] [12], rather than an instrumental deficiency.

4.2.3. The Semi-Structured Guide

The semi-structured interview guide, used with teachers, enabled the collection of qualitative data on their bodily guidance practices and the strategies deployed to adapt their gestures to different student profiles. The interview guide is structured

around five main themes: 1) representations of PE and the body, 2) guidance modalities employed, 3) perception of student reactions, 4) professional experience, 5) adaptive pedagogical strategies. Thematic content analysis [37] was applied to the eight semi-structured interviews (mean duration: 45 min; recorded and transcribed in full). Coding followed a two-stage procedure: inductive open coding, then thematic grouping by categorical saturation, reached after the sixth interview.

5. Results: Presentation, Analysis and Interpretation

The results presented in this section are organized around six analytical axes that progressively build a comprehensive understanding of students' experience of bodily guidance in Physical Education. The first axis examines the overall pattern of discomfort toward guidance across the four gender \times grade-level profiles, using the Weighted Discomfort Index (WDI) as a synthetic indicator. The second identifies points of convergence and divergence between profiles, with particular attention to the asymmetry between cognitive and affective variables. The third explores the amplifying role of peer gaze as a social mechanism that intensifies discomfort experienced during bodily corrections. The fourth characterizes the cognitive-affective paradox—defined as the coexistence of perceived usefulness of guidance and the experienced discomfort in receiving it—and proposes three complementary mechanisms to account for it. The fifth examines extracurricular physical activity as a moderating variable, revealing an unequal distribution of bodily capital among students. The sixth presents the inferential statistical analyses confirming the significance of the observed differences according to gender, grade level, and extracurricular practice. These six quantitative axes are then triangulated, in Section 5.7, with qualitative data from semi-structured interviews conducted with eight PE teachers, whose accounts of perception, interpretation, and pedagogical negotiation of the paradox constitute the final and integrative dimension of the analysis.

5.1. A Disparate Configuration of Discomfort with Bodily Guidance

Results from the analyses show that discomfort toward guidance, structured by two crossed dimensions (gender \times class level), generates very different configurations. As indicated in **Table 3** below, the application of the Weighted Discomfort Index (WDI) reveals important polarization. At one extreme, Grade 12 boys present a WDI of $\approx +8$, signifying near-inexistent discomfort, within the comfortable reception zone. At the other extreme, Grade 11 girls display a WDI of $\approx +60$ (a value eight times higher), placing this subgroup in a zone of major pedagogical tension. Between these two poles, Grade 12 girls (WDI $\approx +51$) and Grade 11 boys (WDI $\approx +14$) occupy intermediate positions that inform us about gender and maturity dynamics.

These results call for a nuanced interpretation, however. The strong discomfort of girls does not necessarily signify a rejection of guidance, insofar as the results concerning perceived effectiveness show that 87.5% of Grade 12 girls and 86.5%

Table 3. Multivariate cross-analysis of four profiles (gender × level) and six key variables.

Profile	Cognitive variables			Pedagogical variables		Affective variables	
	Body as central (Strongly agree %)	Learning with body (Always %)	Bodily development (A lot + Enormously %)	Teacher demo useful (Often + Always %)	Guidance perceived useful (A lot + Strongly agree %)	Comfortable with touch %	WDI ^a
Boys-Grade 12	71.8%	74.4%	70.5%	42.3%	93.0%	64.9%	≈+8
Boys-Grade 11	61.1%	69.4%	63.9%	38.9%	87.5%	58.3%	≈+14
Girls-Grade 12	71.8%	60.5%	64.1%	56.4%	87.5%	38.5%	≈+51
Girls-Grade 11	62.2%	56.8%	56.8%	54.1%	86.5%	27.0%	≈+60

^aWDI = Weighted Discomfort Index. Formula: $WDI = (\% \text{ Uncomfortable} \times 1) + (\% \text{ Indifferent} \times 0.3) - (\% \text{ Comfortable} \times 0.5)$. Range: -50 (maximum ease) to +100 (total discomfort). Source: survey data.

of Grade 11 girls judge guidance useful to their success. This rather signals a dissonance between the cognitive recognition of bodily guidance and its bodily, affective and social experience. It is precisely this dissonance that we call the “cognitive-affective paradox”.

5.2. Convergences Revealing Divergences

On the one hand, the results of **Table 3** also show four profiles converging on cognitive variables. Indeed, the centrality of the body in PE (scores of 61% to 72% depending on profile), perceived guidance effectiveness (86% to 93%) and bodily development (56% to 70%) present fairly homogeneous distributions, without major discontinuity between girls and boys, nor between Grade 11 and Grade 12 students. This means there is no properly cognitive reluctance toward guidance among girls or Grade 11 students. These students are no less convinced of the utility of the body in learning, nor less persuaded of guidance’s effectiveness. They know that guidance works, they understand its pedagogical intention and acknowledge its effects on their motor progression. The divergence is therefore not of epistemic order, but of affective and social order.

On the other hand, the second strongly differentiated variable is the teacher’s demonstration as a model (scores ranging from 38% among Grade 12 Boys to 56% among Grade 12 Girls). At this level, girls seem to value more the teacher’s bodily demonstration, certainly because it offers them access to kinesthetic guidance without the intrusive dimension of direct physical contact. It is within this perspective that one of the teachers surveyed states the following:

“With girls, I prefer demonstration. I show them the movement, break it down, and ask them to correct each other. It works better and avoids misunderstandings.” (Teacher_8)

This is what [31] calls distal guidance—a bodily mediation that respects personal space while activating the mechanisms of embodied cognition through mir-

ror neurons [38].

5.3. The Gaze of Others: An Amplifying Dimension

The multivariate table above (Table 3) reveals another particularly interesting result. Indeed, the variable “comfort with touch” is the one for which the gap between profiles is most pronounced (from 27.0% for Grade 11 Girls to 64.9% for Grade 12 Boys, a gap of 37.9 points), much more so than for cognitive-order variables (centrality of the body, guidance effectiveness), which present much more homogeneous distributions across profiles. This observation from the results points toward a mechanism well identified by [33] and documented in the PE context, namely that peers’ gaze functions as an amplifier of discomfort. In other words, when a teacher touches a female student’s body to correct her posture, this gesture is not experienced solely within the dual student-teacher relationship. It is inscribed in a social space where gazes cross, where bodies are exposed, and where gender norms operate with particular force. The interviews conducted with teachers testify to this with striking precision:

“When you help a girl, the boys say something... I notice that when I correct a girl, some boys stop their activity to watch. It is as if they are waiting for her to fail.” (Teacher_6)

This phenomenon of exposure considerably amplifies the emotional charge of guidance for girls, who perceive the teacher’s gesture not only as an intervention on their own body but as a social event producing visibility and potentially stigmatization. Moreover, cross-analyses confirm this dynamic, insofar as 75.9% of girls who declare feeling “always observed” simultaneously present a high discomfort index, compared to only 25.9% of those who feel “never observed”.

5.4. The Cognitive-Affective Paradox: Magnitude and Explanatory Mechanism

In Table 4 below, the systematic identification of the paradoxical segment

Table 4. Distribution of the cognitive-affective paradox by profile.

Profile	n	n paradox (useful + uncomfortable)	% paradox (within profile)	Tension index (discomfort + perceived utility)	Priority
Boys-Grade 12	39	3	7.7%	−8.5	Near-zero tension
Boys-Grade 11	36	4	11%	−5.2	Mild tension, inexperience without rejection
Girls-Grade 12	39	17	43.6%	+12.4	Moderate tension, utility acknowledged
Girls-Grade 11	37	24	64.9%	+28.1	Maximum tension
Total	151	48	31.8%	+5.7	31.8% of sample in a paradoxical situation

NB: This table isolates students presenting a cognitive-affective paradox: they acknowledge the pedagogical utility of guidance (A lot + Strongly agree) while expressing discomfort (A little + Very uncomfortable). This group is particularly revealing of the ethical tensions in PE. Source: survey data.

[students combining high perceived effectiveness (A lot + Strongly agree) and declared discomfort (A little + Very uncomfortable)] reveals that 31.8% of the total sample presents this configuration. This figure, already significant at the aggregate level, takes on a critical dimension when disaggregated by profile.

The tension index, calculated as the difference between the discomfort score and the perceived utility score, is particularly revealing. For Grade 12 Boys, it is negative (−8.5), signifying that perceived satisfaction clearly outweighs discomfort. For Grade 11 Girls, it reaches +28.1, revealing a major structural tension. In reality, these students simultaneously carry the conviction that guidance would help them and the suffering of receiving it. It is this unresolved tension that defines the full scope of the paradox.

Three mechanisms can account for this contradictory coexistence.

The first of a cognitive order holds that students in a paradoxical situation have integrated, through cumulative school experience, the instrumental value of guidance. In other words, they have observed its effects on their peers, received pedagogical explanations from their teachers, and progressed motorically thanks to it. This cognitive recognition operates independently of affective experience.

The second mechanism of a social order refers to the fact that in a culture like Senegalese culture, where the female body is subject to strong injunctions of modesty and invisibility, consent to guidance cannot be expressed without identity cost. The student who accepts that her teacher touches her body risks being judged by her peers—a judgment that may bear on her femininity, her conformity to gender norms, or even her morality. This social cost is sufficiently high to maintain discomfort, even among students cognitively convinced of the utility of guidance. In this sense, one of the teachers interviewed describes this social mechanism in the following terms:

“In some activities like gymnastics, you sometimes have to physically reposition students. And I often see girls tense up even before I touch them, as if they’re anticipating an intrusion.” (Teacher_6)

The third mechanism, of a developmental order, holds that in adolescence, puberty transforms the body into an object of attention, uncertainty and vulnerability [39] [40]. For Grade 11 students (16 - 18 years old), this process is at its apex. Guidance intervenes at a sensitive biological moment when the body has not yet stabilized into a secure physical identity. This state of developmental vulnerability amplifies discomfort, without however annulling the cognitive recognition of bodily guidance.

5.5. Extracurricular Physical Practice: A Hidden and Moderating Variable

The results have enabled exploration of a dynamic dimension of guidance, showing that the reception of guidance is not an ontological given, but a disposition susceptible to being modulated by contextual and experiential factors. Thus, analysis of the impact of extracurricular physical practice (a reality for 108 students,

representing 70.6% of the sample) reveals that this factor constitutes a significant moderator of guidance reception, as shown in **Table 5**. Students practicing a physical activity outside school present a comfort rate with touch of 47.2%, compared to 26.2% for non-practitioners—a gap of +21 points in favor of the former. This effect is found, with lesser but consistent amplitude, across all variables examined.

Table 5. Impact of extracurricular practice on guidance reception.

Variables	% Comfortable (Practitioners) (n = 108)	% Comfortable (non-practitioners) (27.5%/n = 42)	Difference (Percentage points)
Comfort when touched	47.2%	26.2%	+21.0
Effectiveness of guidance (Very + Quite)	93.5%	81.0%	+12.5
Physical development (A lot + A great deal)	72.2%	59.5%	+12.7
Core training in PE (Definitely)	74.1%	59.5%	+14.6
Learning with the body (Always)	65.7%	50%	+15.7

Source: Survey data.

These results make extracurricular practice not only an indicator of sports socialization, but a genuine bodily capital in the Bourdieusian sense [41]—that is, a set of embodied dispositions that facilitate entry into the pedagogical relationship with the body. Students who practice physical activity outside school have learned, in other contexts, to accept the gaze, receive corrections, and be touched with technical intent. In reality, this extracurricular bodily experience constitutes fundamentally a resource directly mobilizable in PE.

A particularly important aspect of this result is that it reveals a hidden variable in studies on bodily guidance. Indeed, most North American and European works underpinning the literature were conducted in contexts where extracurricular sports practice is widely spread and institutionalized (clubs, school sports associations, etc.). In our study, 27.5% of students practice no physical activity outside school—a significant proportion that concentrates precisely on the profiles least receptive to guidance.

5.6. Inferential Analyses

To determine whether the observed differences across gender, grade level, and extracurricular practice are statistically significant or merely attributable to sampling variability, complementary inferential analyses were conducted on the full dataset, as shown in **Table 6** below.

Regarding discomfort with touch (Q10), a student's t-test reveals a highly significant gender difference ($t(149) = 4.91$, $p < 0.001$), with a large effect size according to Cohen ($d = 0.800$), confirmed by the non-parametric Mann-Whitney test ($U = 4050$, $p < 0.001$). In contrast, no significant difference is observed

Table 6. Inferential statistical tests—validation of inter-group differences.

Hypothesis tested	Test	Statistic	p	Effect size	Conclusion
Discomfort (Q10): Girls > Boys	Student's t	t(149) = 4.91	<0.001	d = 0.800 (large)	Confirmed***
Non-parametric confirmation	Mann-Whitney	U = 4050	<0.001	—	Robust
Discomfort (Q10): grade level (G11 vs G12)	Student's t	t(151) = 0.78	ns (0.434)	d = 0.127 (negligible)	Non-sig.- expected ✓
Discomfort (Q10): extracurricular practice	Student's t	t(148) = 3.74	<0.001	d = 0.660 (medium- large)	Confirmed***
Binarized discomfort × Gender	Chi-square	χ^2 (2) = 6.64	<0.05	V = 0.208 (moderate)	Confirmed*
Q10 by profile gender × grade	ANOVA	F(3, 147) = 6.92	<0.001	η^2 estimated \approx 0.12	Confirmed***
Feeling observed × discomfort (correlation)	Pearson r	r = 0.289	<0.001	— (n = 150)	Link confirmed***

Effect sizes follow Cohen's (1988) conventions: $d < 0.20$ = negligible; $0.20 - 0.49$ = small; $0.50 - 0.79$ = medium; ≥ 0.80 = large. (***) indicates a statistically significant result, (ns) stands for "not significant" and indicates a non-significant result, (✓) indicates a confirmed result, and (*) indicates a result of moderate statistical significance.

across grade level ($t(151) = 0.78$, $p = 0.434$, $d = 0.127$, negligible effect), which is consistent with the theoretical hypothesis that discomfort is structured by gender rather than academic progression. Extracurricular practice constitutes a third significant determinant. In other words, practicing students report significantly lower discomfort than non-practitioners ($t(148) = 3.74$, $p < 0.001$, $d = 0.660$, medium-to-large effect), empirically validating the moderating role of extracurricular bodily capital documented in Section 5.5. A one-way ANOVA on the gender × grade profile ($F(3, 147) = 6.92$, $p < 0.001$) confirms that it is specifically the gender–grade interaction that structures variance in discomfort, rather than grade level alone. Finally, the correlation between the feeling of being observed (Q13) and discomfort with touch (Q10) is positive and significant ($r = 0.289$, $p < 0.001$, $n = 150$), empirically demonstrating the amplifying role of peer gaze on bodily discomfort, theoretically grounded in Goffman (1963). Theoretical and practical implications can be summarized in four propositions. First, gender is the primary and only structuring determinant of discomfort ($d = 0.800$, $p < 0.001$). This difference is large in magnitude, robust across parametric and non-parametric tests, and consistent across all analytical modalities (t-test, Mann-Whitney, Chi-square, ANOVA). Second, school level has no independent effect on discomfort ($d = 0.127$, $p = 0.434$). Post-hoc ANOVA comparisons confirm that all significant differences oppose girls and boys, rather than Grade 11 and Grade 12 students. Third, extracurricular practice constitutes the only modifiable factor ($d = 0.660$, $p < 0.001$). Its medium-to-large effect suggests that bodily capital is a transferable resource in Physical Education, opening concrete avenues for pedagogical intervention. Fourth, peer gaze amplifies discomfort ($r = 0.289$, $p < 0.001$). The covariation between perceived observation and discomfort with touch empirically es-

establishes the mechanism of the Goffmanian gaze, central to explaining the cognitive-affective paradox.

5.7. The Cognitive-Affective Paradox in Teachers' Discourse

Based on semi-structured interviews conducted with eight PE teachers working in selected public high schools in the Dakar-Plateau district, this section examines three interrelated dimensions of the paradox as it appears in teachers' discourse. First, the extent to which teachers are aware of and perceive the paradox in their daily interactions with students. Second, the spontaneous explanatory frameworks they develop to make sense of it, integrating cultural, gender-related, and developmental factors. Third, the adaptive pedagogical strategies they have empirically constructed, without formal training, to navigate between the requirement of physical guidance and students' affective resistance. Taken together, these three dimensions enable a triangulation of the quantitative findings and provide a richer, more grounded understanding of the cognitive-affective paradox as a phenomenon that is simultaneously real, structural, and negotiable.

5.7.1. Teachers' Perception of the Paradox

Although the cognitive-affective paradox was evidenced quantitatively in 31.8% of the sample (Table 4), the interviews reveal that all eight teachers interviewed are clearly aware of it. This finding attests to the reality of this tension in the daily professional experience of Senegalese PE teachers, and constitutes a noteworthy result in itself, considering that it is not an analytical construction external to the actors, but a lived reality named and articulated by the practitioners themselves. The two following excerpts illustrate with precision the internal structure of the paradox as it is perceived and formulated by the teachers:

"I know my students need me to guide them physically to improve. I know they know it too. But some girls will do everything to avoid it. It's not that they don't want to learn (...) they want to learn. They just don't want to be touched. Those are two different things." (Teacher_2)

"What I often experience is a student who asks me to explain why she can't do it, but who, the moment I want to help her physically, steps back. She understands the intention, but her body says no." (Teacher_4)

These formulations clearly illustrate the structure of the paradox, namely that the cognitive recognition of the usefulness of guidance ("she understands the intention") coexists with a bodily experience of resistance ("her body says no"). These two dimensions (understanding and feeling) are clearly distinguished by the teachers, who thereby empirically identify what the literature designates as a cognitive and affective double bind [25] [33]. These teachers' accounts are furthermore consistent with the quantitative findings revealing that among Profile 4 students (Girls-Grade 11), 64.9% simultaneously present a high perceived-usefulness score and a high discomfort score (Table 4, tension index = +28.1). As such, the convergence between quantitative data and teachers' discourse strengthens the

construct validity of the study, in the sense that the paradox is not a measurement artifact but a real phenomenon, perceived and named independently by the teachers.

5.7.2. Teachers' Interpretation of the Paradox

Furthermore, teachers do not merely acknowledge the paradox. They spontaneously produce their own explanatory theories, articulating the cultural, gender-related, and developmental dimensions that the quantitative analysis has objectified.

Indeed, some teachers, such as the one whose words are transcribed below, spontaneously identify cultural norms of bodily modesty as the primary explanatory factor for girls' resistance to physical guidance:

"I think girls know very well that guidance would help them. But they're also thinking about what their classmates will say. It's not a rational choice—it's social pressure." (Teacher_6)

This excerpt highlights the identity cost of consent within a culture of modesty. In reality, the student is not only confronted with her own relationship to her body, but also with the peer gaze and the cultural injunctions that govern bodily interactions between genders. This social mechanism, quantitatively identified as the second explanatory factor of the paradox, is here formulated autonomously by a teacher, which strengthens its empirical validity.

Other teachers, for their part, emphasize the role of maturity and school experience in the reception of physical guidance:

"Grade 12 students have had time to see that a teacher's touch has nothing to do with that of a stranger on the street. It takes time. Grade 11 students don't have that perspective yet." (Teacher_3)

This interpretation is noteworthy on two counts. On the one hand, it converges with the developmental mechanism identified in the quantitative analysis, namely that bodily vulnerability is heightened in Grade 11 compared to Grade 12. On the other hand, it points to a process of progressive socialization toward pedagogical touch, which operates over time and through the accumulation of school experience; a process that the quantitative data partially confirm through the effect of extracurricular practice ($t(148) = 3.74, p < 0.001, d = 0.660$).

Finally, the capacity of teachers to read students' bodily signals as indicators of the paradox constitutes a third interpretive register emerging from the interviews. It is in this sense that a teacher states:

"I've learned to read non-verbal signals. If I see a student tense up, I step back. I comment verbally, I say what I would have done, and I come back later." (Teacher_5)

This excerpt reveals a tacit, non-formalized professional competence: the reading of the body as text. The teacher interprets the student's physical tensing as a signal that the paradox has been activated, with affective resistance overriding cognitive recognition. This real-time reading forms the basis of the adaptive strat-

egies described in the following section.

5.7.3. Pedagogical Negotiation of the Paradox

Faced with the cognitive-affective paradox, teachers do not remain passive. The interviews reveal a repertoire of adaptive strategies developed empirically, without formal training, to navigate between the pedagogical imperative of guidance and students' affective resistance. The interviews brought to light two distinct and complementary registers.

The first register rests on two complementary and inseparable pedagogical practices. The first is prior depersonalization of contact, whereby the teacher explicitly announces the gesture before performing it, allowing the student to visualize the physical intervention before experiencing it, thereby reducing surprise and partially neutralizing affective resistance. The second is the progressive construction of bodily consent, whereby the teacher modulates physical proximity according to the perceived student profile and explicitly leaves the student the choice to accept or refuse contact, thus transforming guidance from an imposed intervention into a negotiated one. These two practices work jointly on the cognitive mechanism of the paradox by making the gesture predictable and consent explicit, which allows the student to mobilize her recognition of the usefulness of guidance before affective resistance is activated. It is in this sense that the following excerpts should be read, illustrating respectively the prior depersonalization of contact and the progressive construction of bodily consent.

“My technique with reluctant profiles is to always name what I m going to do before doing it. ‘I m going to position your leg here.’ The student can visualize the movement before experiencing it. That reduces both the surprise and the discomfort.” (Teacher_7)

“I never touch directly. I place my hand on the shoulder, I say ‘I m going to correct your posture’, and I leave them the choice to say no. In general, they accept because they can see I m respecting their space.” (Teacher_5)

Thus, these two excerpts illustrate a shared logic, that of making the gesture predictable before performing it. By naming the intention, the teacher transforms touch from a potential intrusion into a consented intervention. This strategy operates directly on the cognitive mechanism of the paradox, insofar as the student can mobilize her recognition of the usefulness of guidance before affective resistance is activated.

The second register corresponds to peer mediation, that is, delegating the corrective demonstration to a trusted student, thereby transferring the intervention into a shared space of modesty. The following teacher's account gives a clear illustration of this approach:

“When I sense that direct contact is going to be a problem, I take a trusted student and ask her to show the correct movement to her classmate. The intervention happens between peers, within the same space of modesty. The discomfort almost disappears.” (Teacher_8)

The strategy deployed in this second register circumvents the paradox rather than resolving it. By transferring guidance to a peer, the teacher eliminates the gendered dimension of the interaction (adult teacher vs. female student) and neutralizes the identity cost of consent. The space of modesty is here shared between peers of the same gender, which renders the touch socially acceptable. This mechanism is consistent with the work of [42] on differentiated guidance practices in PE.

Indeed, these two registers converge toward what designate as an integrated bodily consent procedure, that is, a pedagogical intervention modality that makes the intention of guidance explicit, preserves the student's decisional autonomy, and modulates physical proximity according to the perceived profile. The statistical result regarding extracurricular practice ($t(148) = 3.74, p < 0.001, d = 0.660$) provides additional empirical grounding for these strategies. If prior bodily capital significantly reduces discomfort, then teacher interventions aimed at constructing this capital in the school context—which is precisely what these teachers are doing—rest on a solid empirical foundation.

The analysis of the semi-structured interviews made it possible to triangulate and enrich the quantitative findings at three levels. First, it confirms the reality of the cognitive-affective paradox by showing that it is perceived and named independently by teachers, which strengthens its construct validity. Second, it clarifies the explanatory mechanisms of the paradox by adding a bodily and non-verbal dimension that the quantitative data alone could not capture. Finally, it identifies a repertoire of adaptive strategies developed by practitioners, which constitute as many concrete and evidence-based pedagogical intervention pathways.

5.8. A Taxonomy of Four Profiles

By crossing receptivity to guidance and the feeling of being observed, our data have produced a taxonomy of four profiles (Profile 1: confident learner; Profile 2: reluctant observer; Profile 3: confident spectator; Profile 4: vulnerable target) represented below (Table 7), each calling for a distinct pedagogical strategy.

5.8.1. Profile 1: The Confident Learner

This profile, dominant among Grade 12 boys and representing 27% of the sample, is characterized by a double disinhibition: on the one hand, an absence of discomfort toward touch, and on the other, the rare feeling of being observed or judged. Learning through direct guidance is not only accepted but expected as a tool for rapid progress. Interviews confirm this configuration: teachers describe these students as “comfortable with their body”, “who don't make complications”, “who immediately try again when they fail”. For these students, guidance can be mobilized across its entire range—from targeted physical contact to demonstration—without special precautions. The pedagogical challenge is not managing discomfort but optimizing the technical density of interventions. Habituation constitutes the symmetrical risk at this level: overly frequent and systematic guidance can, in

the long term, inhibit motor autonomy [43].

5.8.2. Profile 2: The Reluctant Observer

Identified primarily among Grade 11 boys, this profile represents 12% of the sample. It presents moderate discomfort not linked to social gaze but to bodily inexperience. These students have not yet integrated guidance into their relationship with physical learning. Contact is perceived as an intrusion—not culturally but developmentally—a form of disorientation in the face of a bodily interaction unusual in the school framework. In this perspective, Teacher_7 expresses it thus: “Younger students sometimes have difficulty letting themselves be guided when we correct their posture; they feel embarrassed or avoid contact.” The strategy for this profile is one of progressive mediation: explaining verbally the intention before any contact, soliciting explicit consent, and gradually building bodily confidence over several sessions. [32] shows that satisfaction of the need for autonomy is, in this case, the most powerful determinant of the transition toward increased receptivity.

5.8.3. Profile 3: The Confident Spectator

This profile, estimated at 23% of the sample, characterizes particularly Grade 12 girls. It presents a surface-level paradoxical configuration: relative receptivity to guidance coexists with a strong feeling of being exposed to peers’ gaze. These students accept guidance but experience the correction space as an uncomfortably visible space. They do not reject the teacher’s touch but dread its social effects (comments, judgments, involuntary exposure). This configuration calls for intervention on the social environment rather than on guidance itself: working in small groups, organizing corrections in peripheral spaces, valorizing errors as normal moments of visible learning. The objective is to attenuate the exposure dimension of bodily correction—to limit what it can take on of the spectacular on the social level—in order to fully preserve its pedagogical value.

5.8.4. Profile 4: The Vulnerable Target

This profile, massively represented by Grade 11 girls, constitutes the most critical pedagogical case in the study. Estimated at 37% of the sample, it cumulates the highest discomfort ($WDI \approx +60$, see **Table 1**). These students know that guidance is useful, feel they need it—and yet they suffer from receiving it. This suffering is not an individual fragility but a social construction. Teachers’ discourses paint a striking picture:

“It is cultural: girls are especially told that they do not have the right to spread their legs. There are girls who will tell you that a boy has no right to touch me” (Teacher_2).

These gender injunctions, internalized from primary socialization, transform the body into a minefield for physical guidance. Thus, each contact risks being interpreted as a transgression of modesty norms, regardless of its educational intention.

For this profile, indirect guidance must be the rule, not the exception—that is, demonstration by female peers, precise verbal instructions, deferred proprioceptive feedback, avoidance of direct physical contact until an explicitly constructed relationship of trust is established. Kim *et al.* (2024) [44] advocate the systematic integration of a bodily consent procedure into PE teaching protocols. This is a recommendation that our study validates and reinforces in the Senegalese context.

Table 7. Cross-analysis of guidance receptivity and feeling of being observed.

Profile	%	Dominant gender/level	Description	Warning signal
Profile 1— Confident Learner	27%	Grade 12 Boys	Optimal direct guidance. Engaged, autonomous, confident student. Physical contact accelerates learning without resistance.	Dependency/loss of autonomy
Profile 2— Reluctant Observer	12%	Grade 11 Boys	Discomfort linked to inexperience rather than social gaze. Prioritize demonstration before any contact. Explain intention.	Avoidance without resolution
Profile 3— Confident Spectator	23%	Grade 12 Girls	Accepts guidance but feels exposed to peers' gaze. Work in small groups, back to group, privileged moment.	Withdrawal from central areas
Profile 4— Vulnerable Target	37%	Grade 11 Girls	Profile most at risk of exclusion. Double pressure: bodily discomfort + peers' gaze. Indirect approach imperative (peers, verbal, opt-in).	Abandonment of activity

Source: Survey data.

6. Discussion: Toward a Theory of Differentiated Guidance

Placed in an integrative perspective, the five analyses converge toward a central theoretical proposition: bodily guidance in PE is not a neutral tool whose effectiveness is solely a function of the technical precision of its execution. It is a socially situated tool whose reception depends on a constellation of conditions—gender, class level, extracurricular bodily capital, relationship to peers' gaze, and cultural construction of modesty—that define what might be called the 'acceptable guidance zone' for each student [45]-[47]. A zone that is neither fixed nor definitive, but constructed progressively over the course of school experience, extracurricular practice and the relational quality built by the teacher. This connects with Stodden *et al.* (2023) [48] on the developmental dynamic of perceived motor competence, and [32] on the role of satisfaction of basic psychological needs. However, a contextual specification emerges in contexts marked by strong gender norms and unequal distribution of extracurricular bodily capital—as in Senegal—the acceptable guidance zone is narrower, more heterogeneous, and more sensitive to affective and social variables than the models elaborated in Euro-American contexts had suggested.

7. Conclusions

This study has produced a multivariate and interpretive analysis of bodily guidance in PE, mobilizing mixed analysis instruments on a sample of 153 high school

students and 8 Senegalese teachers. It has highlighted a structuring cognitive-affective paradox (31% of students acknowledge the utility of guidance while expressing discomfort toward touch) and has identified four typological student profiles, each calling for a differentiated guidance strategy. On the theoretical level, the study proposes three major contributions. First, the concept of “acceptable guidance zone” as a subjective and social space defining the conditions for productively received guidance. Second, the analytical distinction between the cognitive dimension (perceived utility) and the affective dimension (felt experience of touch) of guidance reception, and their articulation in a theory of productive tension. Third, the empirical demonstration of the moderating role of extra-curricular bodily capital as a hidden variable in guidance studies in contexts of low sports institutionalization.

Ultimately, this research underlines the importance of adopting a contextual approach to understanding the impact of guidance in PE, particularly in environments where students’ pre-existing bodily experiences vary significantly. Moreover, the results obtained call for a reassessment of the theoretical frameworks of students’ productive disciplinary engagement, integrating cultural specificities and gender dynamics [45]. These new perspectives invite teachers to adapt their motivational style by taking into account the pressures linked to the teaching context, as well as their own relationship to the body and to knowledge, which influences proximity with students [49]. This study contributes to a better understanding of how the bodily dimensions of teachers’ activity can energize, control, accompany and harmonize student engagement.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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